U. S. DEPARTMENT OF COMMERCE

# CIVIL AERONAUTICS JOURNAL

ISSUED TWICE MONTHLY BY THE
CIVIL AERONAUTICS ADMINISTRATION

VOLUME 2 | WASHINGTON, JULY 15, 1941 | NUMBER 14

University

## CAR Amendments Provide Changes in Traffic Rules As Aid to Safety, Defense

### Action Based on Survey, Recommendations of Interdepartmental Body

Two far-reaching amendments to the Civil Air Regulations in the interest of safety and National Defense have been adopted by the Civil Aeronautics Board. These amendments are designed to facilitate the movement of military aircraft as well as to provide greater safety on the airways in the face of the enormous increase in civil and military air traffic now taking place.

The amendments were adopted as a result of the recommendations made by the Interdepartmental Air Traffic Control Board composed of representatives of the Army, Navy, Civil Aeronautics Administration, and the Civil Aeronautics Board. This group conducted a survey covering the greater part of the United States and formulated their recommendations after discussing them with several hundred representatives of every phase of aviation.

The traffic problems caused by the rapid expansion now under way in aviation as a result of the requirements of National Defense and the ever-increasing commercial and private air operations required immediate consideration. These problems were also viewed by the Interdepartmental Control Board in the light of conditions to be expected 1 or 2 years hence with the resulting effect on existing facilities and regulations.

Specifically, the amendments require that as of July 1 all aircraft operating on the civil airways between altitudes of 3,500 feet above the ground and 17,000

(*See* CAR, *page 180*)

## Number of Pilots Shows Sharp Gain; 82,277 on July 1

The number of certificated pilots in the United States continued to increase at a rapid rate during the first 6 months of this year, figures compiled by the Civil Aeronautics Administration reveal. As of July 1 the total was 82,277, compared with 63,113 on January 1.

More than 18,000 of those receiving certificates since the first of the year were graduates of the Civilian Pilot Training Program. As of July 1, there were 78,000 persons holding student pilot certificates.

The mid-year total of 82,277 certificated pilots is divided into the following classifications: Private certificates, 67,763; commercial certificates, 12,583; airline transport certificates, 1,510; limited commercial certificates, 421. The biggest increase was shown in the private certificate classification, from 47,673 as of January 1 to 67,763 as of July 1. In the other categories as of January 1 were airline transport, 1,431; commercial, 9,616; solo, 3,858.

Included in the July 1 total are 2,733 women pilots, divided as follows: 154 commercial, 17 limited commercial, and 2,562 private

The C. A. A. compilation shows a corresponding gain in the number of aircraft registered in the United States. As of January 1 there were 17,351 aircraft which had been granted certificates. This figure rose to 22,025 by July 1.

The number of uncertificated aircraft decreased, from 518 at the beginning of the year to 498 on July 1. This brings the totals of both classes of aircraft to 17,869 on January 1, and 22,523 on July 1.

The totals by States show California still in the lead with 9,965 certificated pilots, compared with 8,285 at the start of the year. New York was second wih 5,765 on July 1, as against 4,863 on January 1. Texas came third with 5,493 against 3,918 on January 1.

The number of certificated glider pilots on July 1 was 145, including 1 woman, as compared with 138 on January 1, including 2 women. As of July 1 there were 54 certificated and 107 uncertificated gliders. Corresponding figures for January 1 were 47 and 129, respectively.

A complete tabulation of certificated aircraft and pilots as of July 1, 1941, is given on page 178.

### Notice

Starting with this issue, the Civil Aeronautics Journal will carry regularly a new feature entitled, "Toward Safer Flight." It will be a brief, succinct account of some specific service rendered by the Civil Aeronautics Administration in the interest of safer flight. The first in the series, describing the accident prevention service of the C. A. A.'s Aircraft Airworthiness Section, appears on page 174 of this issue.

200759—41

U. S. DEPARTMENT OF COMMERCE

# CIVIL AERONAUTICS JOURNAL

ISSUED TWICE MONTHLY BY THE CIVIL AERONAUTICS ADMINISTRATION

VOL. 2 JULY 15, 1941 NO. 14

Published with the approval of the Director of the Bureau of the Budget

**Issued on the 1st and 15th of each month. Subscription $1 (foreign $1.50) per year. Single copies 5 cents. Sold by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.**

## CONTENTS

| | Page |
|---|---|
| **CAR amendments provide changes in traffic rules as aid to safety, defence** | 173 |
| **Certification of pilots continues rapid climb** | 173 |
| **New aeronautical publications** | 174 |
| **Aeronautical legislation pending** | 174 |
| **Toward safer flight** | 174 |
| **C. A. A. revises system of numbering airport runways and landing strips** | 175 |
| **AIR SAFETY** | |
| **Keep safety belts in good shape, C. A. B. bulletin urges pilots** | 176 |
| **Individual accident reports** | 176 |
| **C. A. B. issues report on 1940 non-air carrier accidents** | 177 |
| **May air accident report released** | 177 |
| **PRIVATE FLYING** | |
| **Airport directory ready this month** | 178 |
| **Elmira meet honors Earl R. Southee** | 178 |
| **Auto gas not suitable for aircraft engines** | 178 |
| **MANUFACTURING AND PRODUCTION** | |
| **Civil Aeronautics Administration issues report on aircraft flutter** | 179 |
| **Part 13 amendment changes requirements** | 179 |
| **New type approvals** | 179 |
| **Aero gasoline exports off sharply in April** | 179 |
| **Two new TD reports are now available** | 179 |
| **AIR TRANSPORTATION** | |
| **Board approves extension to Tulsa of Continental's route No. 43** | 180 |
| **Foreign air mail** | 180 |
| **Air carrier certificates** | 180 |
| **Domestic air carrier traffic statistics for 1939, 1940, and the first 5 months of 1941** | 181 |
| **AIRWAYS AND AIRPORTS** | |
| **Airport projects approved** | 182 |
| **Air navigation facilities on July 1** | 182 |
| **C. A. A. issues bulletin on airport lighting** | 182 |
| **Status of airports and landing fields by states, July 1** | 183 |
| **Best lighted in world, say engineers of Washington National Airport** | 184 |
| **14 airports to complete ground helper courses** | 184 |
| **OFFICIAL ACTIONS** | |
| **Orders** | 185 |
| **Regulations** | 186 |
| **Status of Parts of the Civil Air Regulations and amendments** | 188 |

## *New Aeronautical Publications*

Among recent Government publications dealing with the subject of aeronautics are the following:

CIVIL AERONAUTICS AUTHORITY, AERONAUTICAL STATUTES AND RELATED MATERIAL: the Civil Aeronautics Act of 1938, and other statutory provisions relating to Civil Aeronautics together with Reorganization Plans Nos. 3 and 4, certain other nonstatutory material affecting civil aeronautics. 162 pages. Price 15 cents. Classification No. C 31.5: Ae 8.

ADMINISTRATIVE PROCEDURE IN GOVERNMENT AGENCIES; monograph of the Attorney General's Committee on Administrative Procedure, embodying the results of the investigations made by the staff of said Committee relative to the administrative practices and procedures of several agencies of the Government. Printed in (4 parts, part 6 deals with the Civil Aeronautics Authority. 82 pages. Price 15 cents. Classification No. 77-1: S. doc. 10.

CONGRESSIONAL HEARINGSS Commerce Department appropriation, including appropriation for Civil Aeronautics Administration; hearings, 77th Cong., 1st sess., on (H. R. 4276) Department of Commerce appropriation bill for 1942 (Appropriations Committee, House). 754 pages. Price 75 cents. Classification No. Y 4. Ap 6/1: C73/2/942.

When ordering these publications, send remittance by postal money order, express order, coupons, or check to the Superintendent of Documents, Government Printing Office, Washington, D. C. Always give title, issuing office, or classification number when listed.

## *Aeronautical Legislation Pending*

Listed below are recent measures which are now pending before Congress. A complete list of all proposed legislation appeared in Civil Aeronautics Journal, volume 2, No. 11, dated June 1, 1941, and the compilation here brings this up to date.

S. 1635—DEPARTMENT OF AVIATION (McCarran); a bill to establish a Department of Aviation, to consolidate therein the activities of the Government relating to military aviation; and for other purposes; referred to the Committee on Military Affairs.

H. R. 5073—AIRPORT BOUNDARY LINE (Nichols); a bill to establish a boundary line between the District of Columbia and the Commonwealth of Virginia, and for other purposes; referred to the Committee on the District of Columbia.

H. R. 5101—DEPARTMENT OF AVIATION (Sutphin); a bill to establish a Department of Aviation, to consolidate therein the activities of the Government relating to military aviation, and for other purposes; referred to the Committee on Expenditures in the Executive Departments.

H. R. 5116—TRAINING OF TECHNICAL PERSONNEL (Nichols); a bill authorizing the advanced training in aeronautics of technical personnel of the Civil Aeronautics Administration; referred to the Committee on Interstate and Foreign Commerce.

H. R. 5117—REGULATION OF AIRPORT LIGHTING (Nichols); a bill to promote safety in the development of air commerce by regulating the lighting of airports and other landing areas; referred to the Committee on Interstate and Foreign Commerce.

H. R. 5119—TRAINING OF AIR-TRAFFIC CONTROL TOWER OPERATORS; (Nichols), a bill to provide for the training of air-traffic control tower operators; referred to the Committee on Interstate and Foreign Commerce.

### Legislative Action

S. Res. 119—The bill increasing expenditures under Senate Resolution 307 (providing for an investigation of airplane crashes) to $10,000 was passed by the Senate June 28.

S. 1480—LEASING OF PUBLIC LANDS FOR USE AS PUBLIC AVIATION FIELDS; passed by the Senate June 30.

## *Toward Safer Flight:*

Immediate notification to all aircraft owners of any structural defect or fault that may have been found in an airplane of the same make and type as their own is one of the services offered by the Civil Aeronautics Administration in the interest of air safety.

This accident prevention service, generally carried on by the C. A. A.'s Aircraft Airworthiness Section, operates like this:

A serious defect is found in a certain make of airplane, which would preclude the continued safe operation of aircraft of this type. The C. A. A., working in close cooperation with the manufacturer of the airplane in question, immediately notifies all owners of this plane of the defect, its gravity, and what remedial measures should be taken. If the defect is serious enough, this notice might be a rigid restriction or a virtual grounding of all planes of the type involved until this defect is corrected.

Recently, a serious flutter condition was found in the wing structure of a popular airplane used extensively in private flying operations. When it was discovered, the C. A. A. immediately sent telegrams to all owners of this type of plane notifying them of the defect. Then, in cooperation with the manufacturer, a remedy was worked out. These remedial measures have been applied to all the aircraft involved, and now the planes can be operated safely.

The above was an instance where immediate action was essential, therefore the notification was made by telegram. However, in cases where such fast action is not required, the notice is made by registered mail to all owners of the planes involved.

In the event the defect noted needs correction, but is not so serious as the type already described, the manufacturer is permitted to issue a service bulletin to all owners, outlining the proper corrective action that should be taken to make the plane once again airworthy. In this case, C. A. A. field inspectors are instructed to check to see that this action has been taken.

If the defect is very minor, the manufacturer is authorized to take care of it himself through the issuance of service bulletins to all owners. However, if additional reports of this same defect are received at a later date, one of the other methods will be employed by the C. A. A.

# C. A. A. Revises System of Numbering Airport Runways and Landing Strips

## Survey, Recommendations Basis of New Procedure

In response to many recommendations from various aviation organizations, associations, and interested individuals, and after an exhaustive survey to determine the opinions of airport managers, traffic control experts, and pilots, of which a large majority favored a change, the Civil Aeronautics Administration has revised the standard system of numbering airport runways and landing strips.

A few of the aviation associations and organizations and Government departments which have recommended the new system of numbering runways are: Aircraft Owners and Pilots Association, Air Transport Association of America, Airline Pilots Association, Bureau of Aeronautics, United States Navy Department, United States Army Air Corps, National Aeronautic Association, Nebraska Aeronautics Commission, and Massachusetts Aeronautic Commission.

Under the system which has been in general use the landing strip nearest to true north has been numbered "1," and all succeeding runway and landing strip ends were numbered consecutively in a counter-clockwise direction around the airport.

Under the new system of runway numbering, the runway ends are numbered by utilizing the reciprocal of their magnetic bearings. To illustrate: If a runway lies east and west (magnetic), the east end would be numbered 27, representing the reciprocal of the magnetic bearing (270°) which the pilot would follow in making a landing from east to west. Conversely, the west end would be numbered "9" representing 90°. If the runway lies north and south (magnetic) it would be numbered "18" at the north end and "36" at the south end. The last digit is dropped so that runway numbers consist of either one or two numbers.

Runways should be numbered using the nearest even 10° division, as for example: A runway bearing 134° magnetic would be numbered 13. One bearing 137° magnetic would be numbered 14. A runway bearing 217° magnetic would be numbered 22, etc., keeping in mind that the runway end is numbered in accordance with the reciprocal of the magnetic bearing. See CAA Drawing No. 268–A, Revised System of Marking and Numbering Runways, below.

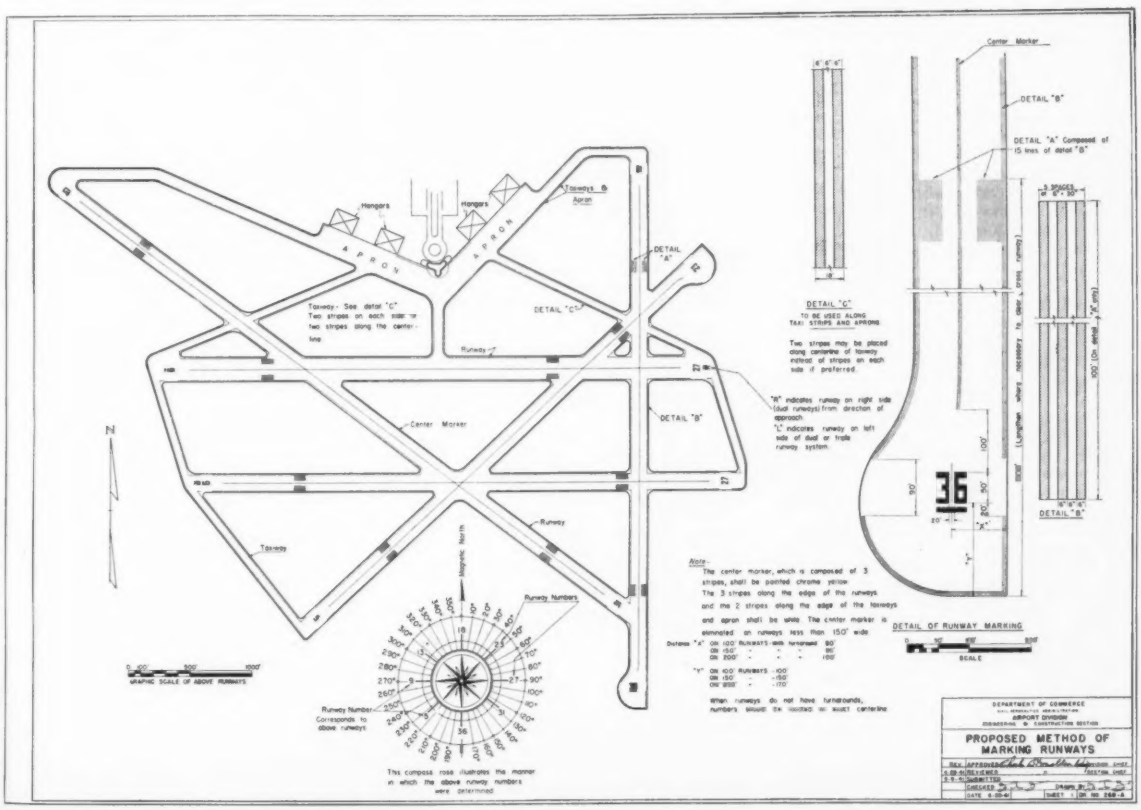
Some of the advantages of the new system of numbering runways and landing strip ends are listed below:

1. The itinerant pilot who is unfamiliar with the airport, upon receiving *landing instructions* by radio, before arriving in sight of the runways, is informed as to the compass direction he must follow in approaching the airport in order to land straight ahead.

2. The runway number assists the pilot receiving *take-off instructions* from the control tower in determining the location of the proper runway end to utilize for take-off.

3. The reciprocal bearing system conveys to the incoming pilot optimum information as to the alignment of the runway which he is to use and obviates the necessity of circling the field to determine to which runway a certain number applies. Under conditions of reduced visibility, when runway numbers are not clearly visible from the air, the advantages of this system are evident.

(*See* RUNWAYS, *page 182*)


Hangers
Hangers
Taxiways & Apron
APRON
APRON
DETAIL "A"
DETAIL "C"
Taxiway - See detail "C" Two stripes on each side or two stripes along the center-line
Runway 7
DETAIL "B"
Center Marker
Runway
Taxiway
N
Magnetic North
Runway Numbers
Runway Number Corresponds to above runways
This compass rose illustrates the manner in which the above runway numbers were determined
Center Marker
DETAIL "B"
DETAIL "A" Composed of 15 lines of detail "B"
DETAIL "C" TO BE USED ALONG TAXI STRIPS AND APRONS
Two stripes may be placed along centerline of taxiway instead of stripes on each side if preferred.
"R" indicates runway on right side (dual runways) from direction of approach
"L" indicates runway on left side of dual or triple runway system
36
DETAIL "B"
DETAIL OF RUNWAY MARKING
Note-
The center marker, which is composed of 3 stripes, shall be painted chrome yellow. The 3 stripes along the edge of the runways and the 2 stripes along the edge of the taxiways and apron shall be white. The center marker is eliminated on runways less than 150' wide
Distance "X" On 100' runways-each turnaround 80'
On 150' - - - 80'
On 200' - - - 100'
"Y" On 100' runways -100'
On 150' - -150'
On 200' - -150'
When runways do not have turnarounds, numbers should be located on each centerline
DEPARTMENT OF COMMERCE
AIRPORT DIVISION
PROPOSED METHOD OF MARKING RUNWAYS

# Air Safety

# Keep Safety Belts in Good Shape, C. A. B. Bulletin Urges Pilots

## Board Stresses Need, Emphasized by Recent Fatal Air Accidents

The vital importance of pilots' keeping their safety belts fastened properly and in perfect condition is the subject of a recent safety bulletin issued by the Civil Aeronautics Board.

"A safety belt is just a belt and isn't safe, unless it is in good shape and fastened properly during every flight," the Board declares. Following is the full text of the bulletin:

### Check Your Safety Belts

A safety belt is just a belt and isn't safe unless it is in good shape and fastened properly during every flight!

The necessity of properly fastening your belt and keeping it fastened is emphasized by two recent fatal accidents. Both these were the direct result of the pilot failing to fasten his safety belt and being thrown clear of the plane. Besides the pilots, three passengers died in these accidents.

Torn or otherwise damaged webbing should not be repaired but should be replaced. In case replacement of webbing or hardware is attempted, the parts should be obtained from the original manufacturer of the belt and stitched with thread of the manufacturer's specifications. The stitch pattern should be identical to the original and the number of threads per inch should be equal to the number used by the manufacturer.[1]

Time, dust, and use deteriorate belts and especially the stitching. A belt that appears to be in good condition may be very weak on account of deteriorated stitching.

Fastening your safety belt should be the first operation in starting a flight. Whenever you carry passengers make certain that their belts are fastened properly. Advise them of the importance of leaving them so. As the pilot in command of the ship, that is your responsibility. *Weak Safety Belts Are False Security For Yourself and Your Passengers.*

[1] Manual-18, MAINTENANCE, REPAIR, AND ALTERATION OF AIRCRAFT, Civil Aeronautics Administration.

[INDIVIDUAL ACCIDENT REPORTS]

## Home-Made Plane Crashes on Test Flight

Failure of the pilot to recover from a dive was the cause of the crash near El Reno, Okla., May 10, 1940, in which uncertificated pilot Earl Allbaugh was fatally injured.

Allbaugh undertook to test fly the plane after he had helped finance its construction. After first testing the taxiing performance of the aircraft, he made a short flight on which the plane attained an altitude of approximately 30 feet. After a landing had been effected, a more extended flight was attempted. The plane made a normal take-off and gained an altitude of approximately 500 feet in a steep climb. The pilot leveled off and a short time later made a 90° turn to the right. After completing this turn the plane was in a normal flight attitude when it suddenly dived to the ground at an angle of approximately 45°.

Witnesses stated that the engine was delivering power until the moment of impact. No apparent effort was made to recover from the dive. The condition of the wreckage prevented any determination of whether or not a structural or control failure had occurred prior to impact.

*Probable cause.*—Failure of the pilot to recover from a dive.

*Contributing factor.*—(1) Inexperience of pilot. (2) Unstable flight characteristics of home-made airplane. (3) Stall after steep climb and 90° turn.

## Stall During Forced Landing Attempt

Engine failure during an attempt to regain altitude after overshooting the airport caused the accident near Nashua, N. H., on February 8, 1940, in which Commercial Pilot Nicholas N. Tamposi and passenger, Emile Bistany, were seriously injured and passengers Jean Bealing and Arthur Bonney slightly injured.

Pilot Tamposi, accompanied by his passengers, took off from the Boston, Mass., Airport on a cross-country flight to Nashua, in a 285-horsepower Beechcraft E17B. The plane was flying over a point approximately 10 miles south of Nashua when the engine began to miss. The pilot pumped the throttle and applied pressure to the fuel by use of the wobble pump until the plane resumed normal operation, when he returned to the altitude at which he had been flying prior to the incident.

Upon arriving at Nashua, the pilot, who had logged 815 hours, circled the airport, descending to about 1,000 feet altitude. He then extended the landing gear and wing flaps as he approached toward the northwest for a landing. The prevailing wind was of about a 10-miles-per-hour velocity from the west-southwest, and the airport was approximately 3,200 feet in length along the direction of approach. The pilot, after overshooting the field, applied power, retracted the landing gear, and closed the flaps to regain altitude for another approach. He then circled to approach diagonally across the field from the southwest. Approximately 1,500 feet were still available for a landing when the pilot, after descending to about 5 feet above the landing area, applied power and regained altitude. As he circled to the left at an altitude of approximately 100 feet the engine again started missing, and the pilot attempted a landing in the field adjacent to the airport. This field is about 1,800 feet long. He overshot this field and the left wing of the airplane struck some trees on the far side of the field, causing the plane to strike the ground on its nose and skid for about 80 feet before coming to stop against a stone fence.

Subsequent investigation disclosed that prevailing weather conditions were conducive to the formation of ice. The evidence indicates that the pilot had not turned on the auxiliary heater control which heats the air at the intake to the carburetor.

*Probable cause.*—Engine failure while attempting to regain altitude after overshooting the airport.

*Contributing factor.*—Poor landing technique of the pilot.

## Aircraft Struck Trees During Turn

An attempt to make a steep turn at an altitude of 50 feet caused the crash June 30, 1940, near Carrollton, Ill., in which Solo Pilot Elmer Dawson was fatally injured and his passenger, Harry Stine, seriously injured.

Prior to the final flight, Dawson, who had logged 106 flying hours, carried several friends on short pleasure flights. A small meadow was used for these operations, and a gusty wind from the southwest of 15 to 25 miles per hour is reported to have prevailed that afternoon. There is a farmhouse situated a short distance from this field, surrounded by tall trees. Passenger Stine was aboard when the pilot took off from the field, which he then circled twice before flying downwind over the field at low altitude. Upon nearing the farmhouse, the pilot attempted to make a steep left turn at an altitude of about 50 feet above the treetops when the aircraft slipped and struck the trees before continuing to the ground, where it was demolished.

Subsequent investigation disclosed that the dual controls were connected and operative at the time of the accident. Pilot Dawson a month previous to the accident had failed to pass a Civil Aeronautics Authority flight test for a private pilot's certificate. The plane was a Curtiss Wright Jr., powered by a 45-horsepower Szekely engine.

*Probable cause.*—Pilot lost control of the aircraft during a steep turn at a low altitude.

*Contributing factor.*—1. Inexperience of pilot. (2) Turbulent air conditions.

## Glider Pilot Loses Control During Tow

Loss of control in a turn during a tow caused the crash near Newport News, Va., on May 19, 1940, in which Glider Pilot Robert C. Platt was fatally injured.

Pilot Platt, who had had 110 flights prior to the accident, was flying a Ross RS–2 Ibis glider and had completed one flight launched by an automobile tow from the Newport News airport when he attempted a second flight. He had instructed the two men operating the tow car to make the initial tow in the same direction as on the previous flight, but upon reaching the edge of the airport they were to make a 180° turn at a speed of about 25 miles per hour and then accelerate to 50 miles per hour during the tow back across the airport. He had further stated that if he encountered any difficulty while prolonging the tow by this procedure, he would release the towline. The tow across the airport was made as planned, and the tow car was making the 180° turn at approximately 25 miles per hour when the towline slackened. When the tow car had completed the 180° turn, a jerk was felt on the line. The glider fell to the ground at an angle of approximately 60° and was demolished. Inspection of the wreckage disclosed that the tow line release had not been operated.

*Probable cause.*—Pilot lost control while attempting a turn with tow rope attached.

*Contributing factor.*—Attempt of pilot and ground crew to perform impracticable maneuvers with tow glider.

## Two Die as Overloaded Wing Falls

Don Phillip LeTourneau and Alton Morrison were fatally injured in an airplane accident which occurred near Canton, N. C., about 9:22 a. m. on August 19, 1940. LeTourneau held a private pilot certificate with class 1 land rating, and at the time of the accident had logged about 76 hours flight time. The plane involved was a Taylorcraft Bc–65.

The pilot and his passenger had taken off from the Toccoa Falls airport on a cross-country flight to Morristown, Tenn., about 116 miles due north. Tractor parts weighing in excess of 60 pounds were being carried which established the fact that the placarded center of gravity limits were exceeded on the flight. Witnesses in the vicinity of Austin, Ga., near Beaver Dam Mountain, N. C., stated that they heard an airplane about 8:45 a. m. flying either in or above the overcast which then prevailed. The sound of this plane was heard for about a half hour before a loud report was heard. The plane was seen diving out of the clouds with a large portion of the right wing folded against the fuselage. The nearly vertical dive continued until the plane struck Beaver Dam Mountain and was demolished.

The airplane was not equipped for blind flying and the pilot was not experienced in instrument flying. A gusty north wind of estimated 20 miles per hour velocity also prevailed. Examination of the wreckage revealed that the leading edge of the right wing had failed in flight, causing disintegration of the wing.

*Probable cause.*—Structural failure of leading edge of right wing in flight.

*Contributing factors.*—(1) Placarded center of gravity limits were exceeded. (2) Inexperience of the pilot, particularly under instrument flight conditions.

## Stall During Low Altitude Turn

A stall during a low-altitude turn caused the crash near Baden, Pa., on August 11, 1940, in which Private Pilot Clarence F. Hartling and his passenger, Robert E. Browning, were fatally injured.

Pilot Hartling, who had logged 240 hours, was accompanied by passenger Browning when he took off on a cross-country flight from Conway Airport, Baden, in an Aeronca LA, powered by a Leblond 70 engine. The evidence indicates that the pilot pulled the aircraft off the ground in a stalled take-off before attaining adequate flying speed. The airplane was then held in a nose-

(*See* ACCIDENT REPORTS, *page 187*)

# May Air Accident Report Released

Twenty-nine fatal accidents occurred in nonair carrier flying during May 1941 compared with 17 in the preceding month, and 20 in the corresponding month of 1940, the Civil Aeronautics Board has reported.

On the basis of preliminary reports, pleasure flights accounted for the largest increase in fatal accidents. Eight more pleasure-flight accidents occurred during May than in April 1941. First reports indicated that they were largely precipitated by low altitude spins, stalls on take-off and low acrobatics. One was the result of an attempt of a pilot inexperienced in night flying to fly at night in inclement weather.

The Nation's air carriers flew over 11,000,000 miles and carried about 300,000 revenue passengers and reported no fatal accidents during May 1941.

Passenger carrying by a student pilot, in violation of the Civil Air Regulations, resulted in death of a pilot and a passenger. There was one accident involving suicide, and two during crop-dusting and seeding operations. A tabulation of the fatal accidents follows:

# CAB Issues Report On 1940 Non-air Carrier Accidents

The Civil Aeronautics Board has released a statistical study of 1940's nonair carrier accidents showing that fatal accidents declined, that most fatal accidents occurred on pleasure flights, and that 80 percent of the accidents reported resulted in no injuries.

Most of the pilots who had accidents during 1940 were landing, taking off, or taxiing aircraft. This was a new trend inasmuch as, in 1939 and theretofore, spins and stalls had been leading contributors to accident lists.

Greater aviation activity was definitely reflected in accident totals for 1940, the Board stated. Figures show a 57-percent increase in nonair carrier accidents and a 102-percent increase in pilots. Also shown is a 167-percent increase in the number of student pilots at the close of 1940.

In the study, made by the Board's Safety Bureau, it is revealed that student and solo airmen, as classes of pilots, had over 41 percent of last year's accidents; that there was a large increase in the number of no or minor injury accidents; that a larger proportion of aircraft had accidents resulting in no or minor damage; that personnel error was the primary cause in 68 percent of the accidents and that aircraft power plant and structural failures declined as causes.

***Type of Flying***

| Factors | Instruction | Pleasure | Commercial | Other | No details | Total |
|---|---|---|---|---|---|---|
| Stall—low altitude | 1 | | | | 1 | 2 |
| Spun in—low altitude | | [1] 2 | [2] 1 | | | 3 |
| Propeller Struck | | | 1 | | | 1 |
| Spectator | | | | | | |
| Uncertificated glider pilot | | 1 | | | | 1 |
| Stalled in take-off | | [3] 3 | | | | 3 |
| Spun in (no details) | | | 1 | | | 1 |
| Inexperienced in night flying | | 1 | | | | 1 |
| Suicide | | | | 1 | | 1 |
| Simulated forced landing | 1 | | | | | 1 |
| Dived at spectator | 1 | | | | | 1 |
| Low acrobatics | | 1 | | | | 1 |
| Hedge-hopping | | 1 | | | | 1 |
| Struck high-tension wire | | | | | 1 | 1 |
| Undetermined | | 4 | [4] 1 | | 4 | 9 |
| Total | 3 | 13 | 4 | 1 | 8 | 29 |

[1] Includes a glider accident involving an uncertificated pilot.
[2] Crop dusting.
[3] One of these involved student pilot carrying passenger.
[4] Crop seeding.

# Private Flying

## Airport Directory Ready This Month

A new edition of Civil Aeronautics Bulletin No. 11, Directory of Airports, will be available sometime this month. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 50 cents each.

Differing from the last compilation, the new directory is in one volume instead of seven, on a national instead of a regional basis. Also, airports are listed in the new directory according to ownership, whereas heretofore, airports have been listed according to the type of service offered. For instance, in past directories, a small municipal airport that offered limited servicing was listed as an auxiliary airport. Under the new system, this is included under the municipal heading.

A total of 2,246 airports is covered in the new directory. Included in the description are 957 airports with servicing, 276 with paved runways, 379 with two-way radio, and 642 lighted airports.

The division by class is as follows: Municipal, 1,080; commercial, 558; private, 159; Army, 73; Navy, 22; miscellaneous Government, 38; C. A. A. intermediate fields, 289; total, 2,246. The total usable acreage of the airports listed is 247,377.

## Auto Gas Not Suitable For Aircraft Engines

The vital importance of aircraft operators using only aviation grade fuel in their planes and the danger of major engine damage if other fuel is used is pointed out in a maintenance bulletin that has been distributed to Civilian Pilot Training Program flight contractors by the Civil Aeronautics Administration.

"The use of automotive fuels, refinery gas, and other such fuels has been determined unsatisfactory," the bulletin states. "For this reason it is required that only the proper grade of aviation fuel for which the particular engine is certificated shall be used in your engines. Otherwise, the continuation of your contract will be jeopardized."

The bulletin points out that considerable difficulty is being experienced due to cracked piston and cylinder heads, rings and valves sticking, and poor idling characteristics where operators are using automobile gasoline in their aircraft engines. At present no aircraft engines are certificated for operation on automobile fuels.

"There is a vast difference between the characteristics of aviation and automobile fuels, all of which cannot be covered in this bulletin. However, it is believed that most operators base

(*See* AUTO GAS, *page 183*)

## Elmira Meet Honors Earl R. Southee

Testimonial exercises and a soaring demonstration were held at the Twelfth Annual National Soaring Contest at Elmira, N. Y., in honor of Earl R. Southee, now Chief of the Standards Division of the C. A. A. pilot training service.

Mr. Southee, who holds a commercial glider certificate, an F. A. I. soaring certificate, and is a licensed airplane pilot, was manager of the Elmira meets from 1931 through 1936.

### *Status of Certificated Aircraft and Pilots, by States, as of July 1, 1941*

| State | Aircraft | | | Gliders | Pilots | | | | | Glider pilots |
|---|---|---|---|---|---|---|---|---|---|---|
| | Certificated | Uncertificated | Total | | Airline transport | Commercial | Limited commercial | Private | Total | |
| Alabama | 152 | 1 | 153 | ..... | ..... | 134 | 3 | 798 | 935 | ..... |
| Arizona | 130 | 1 | 131 | ..... | ..... | 70 | 1 | 517 | 588 | ..... |
| Arkansas | 171 | 4 | 175 | ..... | ..... | 98 | 2 | 824 | 924 | ..... |
| California | 2,174 | 88 | 2,262 | 47 | 178 | 1,885 | 45 | 7,857 | 9,965 | 18 |
| Colorado | 220 | 4 | 224 | 1 | 24 | 126 | 1 | 1,109 | 1,260 | 1 |
| Connecticut | 244 | 1 | 245 | 2 | 2 | 131 | 5 | 583 | 721 | 3 |
| Delaware | 123 | ..... | 123 | ..... | ..... | 30 | 4 | 177 | 211 | ..... |
| District of Columbia | 258 | 3 | 261 | ..... | 8 | 134 | 3 | 522 | 667 | 1 |
| Florida | 499 | 1 | 500 | 2 | 108 | 422 | 5 | 1,324 | 1,859 | ..... |
| Georgia | 326 | 4 | 330 | 3 | 65 | 244 | 3 | 1,013 | 1,325 | ..... |
| Idaho | 103 | ..... | 103 | ..... | ..... | 60 | 2 | 665 | 727 | ..... |
| Illinois | 1,221 | 9 | 1,230 | 17 | 204 | 571 | 25 | 3,038 | 3,838 | 8 |
| Indiana | 622 | 24 | 646 | 4 | 3 | 267 | 19 | 1,682 | 1,971 | 4 |
| Iowa | 468 | 8 | 476 | 1 | 5 | 209 | 9 | 1,659 | 1,882 | ..... |
| Kansas | 469 | 24 | 493 | 1 | 1 | 201 | 3 | 1,814 | 2,019 | 1 |
| Kentucky | 157 | 10 | 167 | ..... | 1 | 68 | 1 | 438 | 508 | ..... |
| Louisiana | 252 | 1 | 253 | ..... | 13 | 147 | 6 | 1,073 | 1,239 | ..... |
| Maine | 174 | 2 | 176 | ..... | 1 | 82 | 8 | 360 | 451 | ..... |
| Maryland | 308 | 8 | 316 | 1 | 3 | 124 | 8 | 764 | 899 | 1 |
| Massachusetts | 503 | 4 | 507 | 7 | 30 | 318 | 15 | 1,592 | 1,955 | 3 |
| Michigan | 895 | 20 | 915 | 23 | 30 | 357 | 18 | 2,755 | 3,160 | 27 |
| Minnesota | 512 | 39 | 551 | 2 | 53 | 261 | 15 | 1,435 | 1,764 | ..... |
| Mississippi | 143 | 5 | 148 | ..... | ..... | 89 | ..... | 574 | 663 | ..... |
| Missouri | 602 | 14 | 616 | 1 | 99 | 475 | 3 | 2,103 | 2,680 | 3 |
| Montana | 155 | 12 | 167 | 1 | ..... | 77 | 2 | 640 | 719 | ..... |
| Nebraska | 192 | 10 | 202 | 1 | ..... | 118 | 5 | 988 | 1,111 | 2 |
| Nevada | 66 | 1 | 67 | ..... | ..... | 25 | ..... | 213 | 238 | ..... |
| New Hampshire | 80 | 1 | 81 | 1 | ..... | 42 | 5 | 297 | 344 | 2 |
| New Jersey | 625 | 7 | 632 | 7 | 22 | 338 | 12 | 1,590 | 1,962 | 9 |
| New Mexico | 120 | 2 | 122 | ..... | 1 | 47 | 2 | 479 | 529 | ..... |
| New York | 1,610 | 14 | 1,624 | 17 | 258 | 1,069 | 38 | 4,400 | 5,765 | 35 |
| North Carolina | 432 | 13 | 445 | ..... | ..... | 153 | 13 | 1,041 | 1,207 | 1 |
| North Dakota | 121 | 13 | 134 | ..... | ..... | 54 | 2 | 535 | 591 | ..... |
| Ohio | 1,174 | 22 | 1,196 | 3 | 16 | 514 | 33 | 3,014 | 3,577 | 7 |
| Oklahoma | 443 | 6 | 449 | 1 | ..... | 348 | 8 | 1,739 | 2,095 | ..... |
| Oregon | 268 | 21 | 289 | 1 | 21 | 141 | 4 | 1,127 | 1,293 | ..... |
| Pennsylvania | 2,163 | 6 | 2,169 | 3 | 18 | 602 | 33 | 3,456 | 4,109 | 13 |
| Rhode Island | 164 | ..... | 164 | ..... | 2 | 40 | 3 | 276 | 321 | 1 |
| South Carolina | 202 | 2 | 204 | ..... | ..... | 90 | 3 | 768 | 861 | ..... |
| South Dakota | 103 | 4 | 107 | ..... | 1 | 56 | 1 | 520 | 578 | ..... |
| Tennessee | 285 | 3 | 288 | 1 | 23 | 201 | 3 | 1,255 | 1,482 | ..... |
| Texas | 1,237 | 41 | 1,278 | 2 | 163 | 847 | 8 | 4,475 | 5,493 | ..... |
| Utah | 99 | 1 | 100 | 3 | 32 | 85 | 1 | 645 | 763 | ..... |
| Vermont | 69 | ..... | 69 | ..... | ..... | 30 | 2 | 255 | 287 | ..... |
| Virginia | 372 | 2 | 374 | 1 | 21 | 216 | 8 | 977 | 1,222 | 1 |
| Washington | 374 | 7 | 381 | 5 | 47 | 313 | 4 | 1,757 | 2,121 | 2 |
| West Virginia | 196 | 1 | 197 | ..... | 1 | 103 | 9 | 833 | 946 | ..... |
| Wisconsin | 427 | 27 | 454 | 2 | 3 | 187 | 12 | 1,120 | 1,322 | 1 |
| Wyoming | 80 | 5 | 85 | ..... | 18 | 39 | ..... | 301 | 358 | ..... |
| Alaska | 170 | 2 | 172 | ..... | 1 | 113 | 1 | 84 | 199 | ..... |
| Canada [1] | 1 | ..... | 1 | ..... | 6 | 50 | 2 | 27 | 85 | ..... |
| Canal Zone | ..... | ..... | ..... | ..... | 1 | 21 | ..... | 19 | 41 | ..... |
| Hawaiian Islands | 40 | ..... | 40 | ..... | 1 | 62 | 3 | 181 | 247 | ..... |
| Mexico [1] | ..... | ..... | ..... | ..... | ..... | 2 | ..... | 5 | 7 | ..... |
| Philippine Islands [2] | 1 | ..... | 1 | ..... | ..... | 14 | ..... | 8 | 22 | ..... |
| Puerto Rico | 23 | ..... | 23 | ..... | ..... | 10 | ..... | 31 | 41 | ..... |
| Foreign, miscellaneous [1] | 7 | ..... | 7 | ..... | 26 | 73 | ..... | 31 | 130 | 1 |
| Total | 22,025 | 498 | 22,523 | [3] 161 | 1,510 | 12,583 | 421 | 67,763 | 82,277 [4] | [5] 145 |

[1] Figures for these countries are for aircraft and pilots registered by the United States.
[2] Civil aircraft in the Philippine Islands are now registered with the local government.
[3] Includes 54 certificated and 107 uncertificated gliders.
[4] Includes 2,733 women pilots divided as follows: 154 commercial, 17 limited commercial, and 2,562 private.
[5] The glider pilots include 1 woman.

## Part 13 Amendment Changes Requirements

Airworthiness requirements for aircraft engines have been changed to require more exhaustive tests, the Civil Aeronautics Board stated in announcing amendment of part 13 of the Civil Air Regulations.

The outstanding single change brought about by the amendment pro-

(*See* PART 13, *page 183*)

## New Type Approvals

*[Approval numbers and dates of assignment in parenthesis]*

### *Type Certificates*

#### *Appliances*

Columbia, skis, model S–1. Approved static load per ski 600 pounds (142, June 13, 1941).

## New Models Added to Old Type Approvals

*[Approval numbers and dates of approval of new models in parenthesis]*

#### *Aircraft*

Culver, LFA, 2-place closed land monoplane. Engine, Franklin 4AC–176–F3 (type certificate No. 730, June 7, 1941).

Beechcraft, SF17D, 5-place closed sea biplane. Engine, Jacobs L–6, L–6M or L–6MB (type certificate No. 689, June 10, 1941).

Rearwin, 8135T, 2-place closed land monoplane. Engine, Rearwin Ken Royce 7G (type certificate No. 711, June 13, 1941).

#### *Propellers*

Sensenich, 70AB, wood, 5 feet 10 inches diameter, 4 feet 8 inches to 3 feet 10 inches pitch, 90-horsepower, 2,500 revolutions per minute (type certificates No. 734, June 7, 1941).

Freedman-Burnham, PC–2 propeller with P–216A blades, metal hub and wood blades, 6 feet 0 inch to 5 feet 10 inches diameter, adjustable pitch, 80-horsepower, 2,700 revolutions per minute (type certificate No. 704, June 12, 1941).

Freedman-Burnham, PX–2 propeller with P–216A blades, metal hub and wood blades, 6 feet 0 inch to 5 feet 10 inches diameter, adjustable pitch, 80-horsepower, 2,650 revolutions per minute (type certificate No. 746, June 12, 1941).

Freedman-Burnham, PY–2 propeller with P–216A blades, metal hub and wood blades, 6 feet 0 inch to 5 feet 10 inches diameter, adjustable pitch, 80-horsepower, 2,650 revolutions per minute (type certificate No. 747, June 12, 1941).

Freedman-Burnham, PC–2 propeller with P–205 blades, metal hub and wood blades, 6 feet 6 inches diameter, adjustable pitch, 90-horsepower, 2,500 revolutions per minute (type certificate No. 704, June 12, 1941).

Freedman-Burnham, PX–2 propeller with P–205 blades, metal hub and wood blades, 6 feet 6 inches diameter, adjustable pitch, 90-horsepower, 2,500 revolutions per minute (type certificate No. 746, June 12, 1941).

Freedman-Burnham, PY–2 propeller with P–205 blades, metal hub and wood blades, 6 feet 6 inches diameter, adjustable pitch, 90-horsepower, 2,500 revolutions per minute (type certificate No. 747, June 12, 1941).

#### *Appliances*

Air Transport, skis, model 1620–750. Approved static load per ski 810 pounds (type certificate No. 66, June 7, 1941).

## Airworthiness Certificates Only, for Gliders

Kursawe, Kirby Kite, 1-place open land monoplane, class III (2–8, June 9, 1941).

# Manufacturing and Production

# Civil Aeronautics Administration Issues Report on Aircraft Flutter

## Will Aid Manufacturers in Meeting Regulations

A second report resulting from the Civil Aeronautics Administration's studies concerning flutter in aircraft has been released. It is Aircraft Airworthiness Section Report No. 23, entitled PERPENDICULAR AXES CONTROL SURFACE BINARY FLUTTER. Copies may be obtained free from the Publications and Statistics Division of the Civil Aeronautics Administration, Washington, D. C.

The report is applicable to the determination of the flutter speeds for the following modes: Wing-bending aileron, fuselage torsion rudder, fin-bending rudder, stabilizer-bending elevator, fuselage torsion unsymmetrical elevator. It is supplementary to Aircraft Airworthiness Section Report No. 22, entitled FLEXURE-TORSION BINARY FLUTTER, issued with Certificate and Inspection Division Release No 37, dated February 1, 1941, as applicable to the determination of the flutter speeds of wings and fixed control surfaces.

Another report, covering the parallel axes cases comparable to the above binary flutter modes, is in the course of preparation for release. It will be issued as Aircraft Airworthiness Section Report No. 24, entitled PARALLEL AXES CONTROL SURFACE BINARY FLUTTER.

Because of the need for more accurate information regarding the speed at which flutter will occur, and the release of that information in a form directly usable by aircraft designers not particularly conversant with flutter theory, the Aircraft Airworthiness Section has sponsored this study in order that the present regulations and manual material concerning flutter may be met more conveniently by aircraft manufacturers.

The study reveals that the principal parameters found to be of importance are surface weight, chord ratio, dynamic balance of control surface, structural damping, structural frequencies, and frequency ratios.

In connection with further work on this subject and its related aspects, recipients of this report are asked to forward data pertaining to amplitude measurements obtained during vibration tests, as well as any other information not only on structural characteristics of aircraft but also on known cases of flutter within their experience. Comments and criticism should be addressed to the Civil Aeronautics Administration, Department of Commerce, Washington, D. C., Attention: Aircraft Airworthiness Section.

## Aero Gasoline Exports Off Sharply in April

A drastic drop in the exports of aviation gasoline from 497,000 barrels for March to 63,000 barrels for April has been reported by the Bureau of Mines. The latter figure, according to the report, included 5,000 barrels of antiknock compounds. Exports for April 1940 amounted to 410,000 barrels. During the first 4 months of this year, however, the exports of aviation gasoline exceeded that for the first 4 months of last year, the respective figures being 1,355,000 and 1,203,000 barrels.

Production for April was 1,633,000 barrels, as against 1,448,000 for March, and 1,441,000 for April 1940. During the first 4 months of this year production totalled 5,885,000 barrels, compared with 4,762,000 barrels for the corresponding period of last year. Stocks at the end of April were 7,347,000 barrels, as against 6,876,000 on March 31, and 5,178,000 on April 30, 1940.

## Two New TD Reports Are Now Available

Two new Technical Development Reports, Nos. 26, and 27, are now available. Copies may be obtained from the Publications and Statistics Division, Civil Aeronautics Administration, Washington, D. C.

DEVELOPMENT OF AN IMPROVED CRYSTAL EXCITER UNIT is the title of No. 26, which was written by C. H. Jackson, also of the C. A. A.'s Radio Development Section.

Marcus O'Day, professor, Department of Electrical Engineering, Reed College, wrote No. 27, THE EFFECT OF A HIGH-FREQUENCY DISTURBANCE ON THE DIRECT-CURRENT CORONA FROM A SHARP POINT.

# Air Transportation

## Board Approves Extension to Tulsa of Continental's Route No. 43

### Denies 3 Applications Filed by Other Carriers

Applications for certificates of public convenience and necessity authorizing new airline routes between Kansas City, Mo., and New Orleans, La., and between Wichita, Kans., and New Orleans, have been denied by the Civil Aeronautics Board. In the same decision, which was based on a consolidated proceeding, the application of Continental Airlines, Inc., for an extension of its route No. 43, from Wichita, Kans., to Tulsa, Okla., was granted.

Kansas City Southern Transport Co. had proposed inauguration of a direct route between Kansas City and New Orleans serving the territory now traversed by the Kansas City Southern Railway and including Tulsa. Mid-Continent Airlines, Inc., had proposed service between the same points by extension of its route No. 26 south from Tulsa. Braniff Airways, Inc., had proposed through single-company service between Wichita and New Orleans as well as to principal intermediate points covered in the applications of Kansas City Southern and Mid-Continent.

Continental's route No. 43 now extends between the terminal points Pueblo, Colo., and Wichita, Kans., with intermediate stops at La Junta, Colo., Garden City, Dodge City, and Hutchinson, Kans.

Service on the extension, between Wichita and Tulsa, may not be inaugurated until the Board is advised by the War and Navy Departments whether the national defense requirements for aviation equipment and personnel necessitate deferment of the service.

Continental had also applied for authority to stop at Bartlesville, Okla., on the Wichita-Tulsa extension. However, the Board deferred its decision with respect to this point pending final disposition of an application by Mid-Continent now pending to include Bartlesville as a stop on its route No. 26 between Kansas City, Mo., and Tulsa, Okla.

### *Foreign Air Mail*

Beginning at once, air mails for U. S. S. R., Lithuania, Latvia, and Estonia will be dispatched via the Pacific coast and the trans-Pacific air mail route, and then be sent from Hong Kong by ordinary means, the Post Office Department has announced. The total postage will be 70 cents per half ounce.

## CAR

(*Continued from page 173*)

feet above sea level must at all times be equipped with a radio receiver,[1] radio transmitter,[2] and a sensitive type altimeter. The observance of these regulations does not require a pilot to hold an instrument rating except when flying under instrument weather conditions. When entering an area under the jurisdiction of a United States Airway Traffic-Control Center the pilot must file a flight plan. File, preferably before take-off, with the nearest airway control station. See Part 3, Civil Aeronautics Manual 60 concerning flight plans. Bear in mind that parts of it are superseded by new regulations. NOTE: Advise on arrival, or of any change in plans. In addition, all aircraft flying between 3,500 and 17,000 feet on civil airways, whether in or out of a control area, must maintain specified altitudes, odd or even thousands, according to the color of the airway and your direction of flight. See CAR 60.53. You must also keep listening to the nearest airways communication station. As you approach each station you must give a position report containing NC number, make of plane, position, and next station to which you will report. Before entering a control zone of intersection you must call, giving the same information plus the time you expect to be over the center of the zone. The ground station will give you landing instructions or clear you through the zone.

The Civil Aeronautics Board also designated the air space above 17,000 feet for military operation, except for special authorized commercial operations or civil flight in the interests of aeronautical development, by specific authorization of the Administrator.

The air space below 3,500 feet above the ground or water on civil airways, or above 3,500 feet *off* the airways, remains free for the use of all pilots with no more restrictions than heretofore. This permits owners of aircraft who do not have the necessary equipment to fly cross country with the same convenience as in the past. This area also remains available for flight training.

At the same time the Board simplified the previous regulations governing the visibility and ceiling requirements on the airways by striking out passages in the regulations which were confusing to many pilots.

Further amendments require that pilots flying contact shall fly 500 feet below or above an overcast. The rule previously in force required only 300 feet. The purpose of this rule is to reduce the danger of collision between an aircraft suddenly emerging from a cloud and one immediately below or above the cloud and takes into consideration the great increase in speed of aircraft. (The full text of the amendments can be found beginning on p. 186 of this issue.)

[1] Receiving from 200 to 400 kc. normal range 100 miles. It should receive voice broadcasts intelligibly; some small ones do not.

[2] Transmitter should give clear voice transmission on correct frequency. Battery operation is permissible. Maximum range should be 25 miles, to cover radius of a control zone intersection. NOTE: Obtain from the F. C. C. a restricted telephone permit and a station license for your plane.

## Statistical Summary

The revenue passenger miles and express pound-miles flown by 16 domestic scheduled airlines in May 1941 represented al-time highs, statistics compiled by the Civil Aeronautics Administration reveal.

Marking a gain of 34.68 percent over the figure for May 1940, the revenue passenger miles reported by the carriers in May of this year totaled 122,809,564. It also marked a substantial gain over the April 1941 figure of 103,511,893. The previous peak month in this category was October 1940 when 311,406 revenue passengers flew 115,362,695 revenue passenger miles.

The total revenue passenger miles flown by the airlines during the first 5 months of 1941 were 456,436,971, as against 352,274,834 in the corresponding period of 1940, or an increase of 29.57 percent.

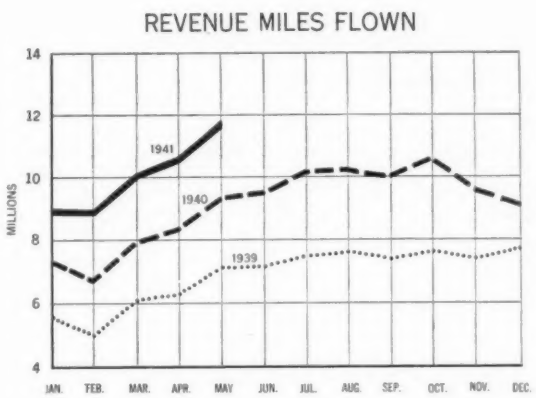
In May of this year 11,667,933 revenue miles were flown and 338,028 revenue passengers carried, compared with 9,266,687 revenue miles and 238,300 revenue passengers in May 1940, the respective gains being 25.91 percent and 41.85 percent. In April 1941 the airlines flew a total of 10,536,916 revenue miles and carried 282,522 revenue passengers. For the first 5 months of 1941 the totals were 39,472,552 revenue miles and 886,161 revenue passengers, compared with 39,472,552 revenue miles and 886,161 revenue passengers for the first 5 months of 1940. The percent of increase of the

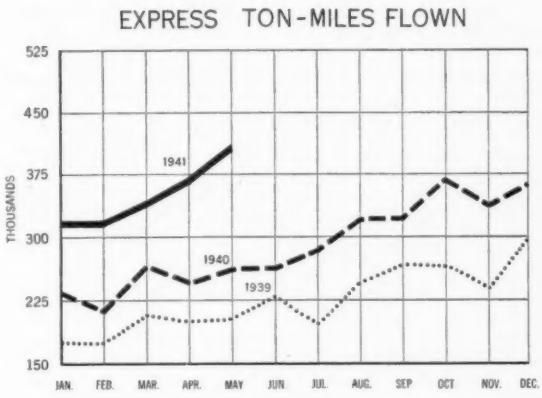
(*See* SUMMARY, *page 187*)

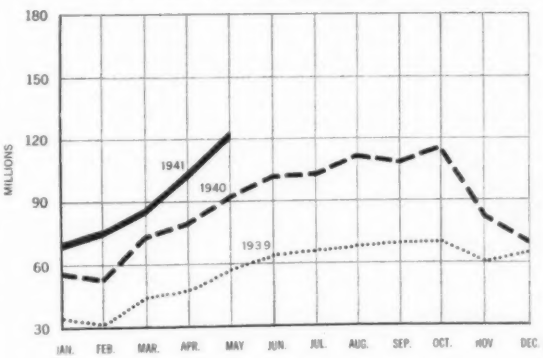
### *Air Carrier Certificates*

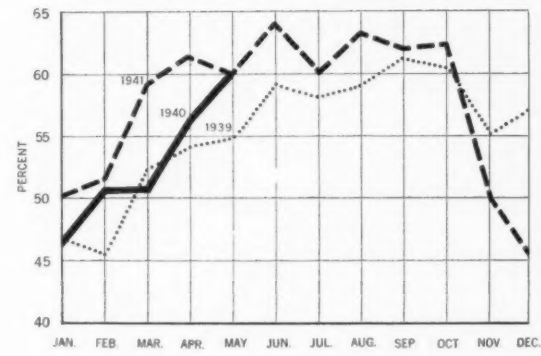
A summary of information regarding the preparation of an application for Air Carrier Operating Certificate is now available and may be obtained on request to the Publications and Statistics Division, Civil Aeronautics Administration, Washington, D. C. The pamphlet was prepared by the Air Carrier Inspection Section.

## *Domestic Air Carrier Traffic Statistics for 1939, 1940, and the First 5 Months of 1941*




## *Domestic Air Carrier Traffic Statistics for May 1941*

| Operator | Revenue miles flown | | Revenue passengers carried | | Revenue passenger miles flown | | Express pound-miles flown | | Revenue passenger load factor (percent) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | May 1941 | Percent change over 1940 | May 1941 | Percent change over 1940 | May 1941 | Percent change over 1940 | May 1941 | Percent change over 1940 | May 1941 | May 1940 |
| American Airlines, Inc. | 2,870,649 | 30.31 | 110,801 | 48.92 | 37,375,530 | 37.88 | 199,563,267 | 57.30 | 70.95 | 70.68 |
| Braniff Airways, Inc. | 456,582 | 7.96 | 12,580 | 18.90 | 3,781,078 | 12.09 | 16,558,170 | 33.05 | 47.85 | 50.92 |
| Catalina Air Transport, Inc. | 16,200 | 27.29 | 3,302 | 32.50 | 99,060 | 32.50 | 523,800 | 12.77 | 61.97 | 58.35 |
| Chicago & Southern Air Lines, Inc. | 223,425 | 24.85 | 5,505 | 27.96 | 2,132,242 | 33.44 | 8,646,407 | 31.72 | 48.13 | 46.86 |
| Continental Air Lines, Inc. | 120,817 | .83 | 1,623 | 20.40 | 499,920 | 27.39 | 615,350 | −1.89 | 34.45 | 46.38 |
| Delta Air Corporation | 265,962 | 41.93 | 7,175 | 58.56 | 1,892,939 | 62.80 | 3,743,768 | 95.42 | 40.26 | 53.00 |
| Eastern Air Lines, Inc. | 1,628,799 | 27.84 | 44,876 | 50.52 | 16,734,510 | 36.20 | 107,573,486 | 67.86 | 51.62 | 54.66 |
| Inland Air Lines, Inc. | 102,358 | −.56 | 1,100 | −.921 | 285,485 | −4.05 | 377,925 | 6.15 | 27.89 | 28.91 |
| Mid-Continent Airlines, Inc. | 191,308 | 36.86 | 3,423 | 49.87 | 886,428 | 45.63 | 1,628,628 | 33.37 | 41.73 | 43.54 |
| National Airlines, Inc. | 143,218 | 65.14 | 3,200 | 103.30 | 772,858 | 104.17 | 1,394,776 | 124.23 | 40.93 | 43.65 |
| Northeast Airlines, Inc. | 101,580 | 45.86 | 2,734 | 42.77 | 469,846 | 66.32 | 655,571 | 56.71 | 44.93 | 40.57 |
| Northwest Airlines, Inc. | 543,629 | 9.21 | 13,646 | 17.64 | 5,587,460 | 25.29 | 28,696,647 | 35.52 | 51.13 | 43.95 |
| Pennsylvania-Central Airlines Corporation | 582,374 | 63.61 | 29,853 | 61.57 | 5,828,828 | 73.61 | 18,484,580 | 74.28 | 50.99 | 61.69 |
| Transcontinental & Western Air, Inc. | 1,870,638 | 38.53 | 42,177 | 47.52 | 19,385,157 | 42.58 | 150,052,786 | 85.14 | 58.89 | 61.54 |
| United Air Lines Transport Corporation | 2,296,991 | 11.88 | 50,003 | 21.86 | 25,139,798 | 20.88 | 252,261,323 | 40.56 | 67.54 | 61.99 |
| Western Air Express Corporation | 253,403 | 30.74 | 6,030 | 46.72 | 1,938,425 | 40.06 | 23,841,496 | 59.65 | 50.20 | 55.08 |
| Total | 11,667,933 | 25.91 | 338,028 | 41.85 | 122,809,564 | 34.68 | 814,617,980 | 55.81 | 59.56 | 60.04 |

# Airways and Airports

## *Airport Projects Approved*

In accordance with the provisions of section 303 of the Civil Aeronautics Act, the Administrator of Civil Aeronautics has issued certificates of air navigation facility necessity, authorizing the expenditure of Federal funds in the operation of the following projects:

**ALABAMA**

| | |
|---|---|
| Alexander City, Alexander City Airport (WPA) | $49,125.00 |

**CALIFORNIA**

| | |
|---|---|
| Chico, Municipal Airport (WPA) | 40,822.00 |
| Salinas, American Legion Municipal Airport (WPA) | 519,984.00 |

**FLORIDA**

| | |
|---|---|
| Cedar Keys, Cedar Keys Airport (WPA) | 42,370.00 |

**GEORGIA**

| | |
|---|---|
| Atlanta, Municipal Airport (CAA–WPA) | 840,101.00 |

**IDAHO**

| | |
|---|---|
| Hoodoo Meadows, Hoodoo Meadows Landing Field (Forest Service) | 1,500.00 |
| Idaho Falls, Municipal Airport (CAA–WPA) | 122,813.00 |

**IOWA**

| | |
|---|---|
| Iowa City, Municipal Airport (WPA) | 137,194.00 |

**KENTUCKY**

| | |
|---|---|
| Lexington, Municipal Airport (CAA–WPA) | 195,388.00 |

**LOUISIANA**

| | |
|---|---|
| New Orleans, Municipal Airport (WPA) | 76,678.00 |

**MAINE**

| | |
|---|---|
| Belfast, Municipal Airport (WPA) | 332,500.00 |

**MASSACHUSETTS**

| | |
|---|---|
| Beverly, Beverly Airport (WPA) | 77,567.00 |
| Fitchburg, Fitchburg & Leominster Airport (WPA) | 82,666.00 |
| Hyannis, Hyannis Airport (CAA–WPA) | 214,701.00 |

**MINNESOTA**

| | |
|---|---|
| Ely, Ely Seaplane Base (Forest Service) | 15,000.00 |
| Minneapolis, Municipal Airport (WPA) | 2,115,994.00 |
| Willmar, Municipal Airport (NYA) | 20,540.00 |

**MISSISSIPPI**

| | |
|---|---|
| Brookhaven, Municipal Airport (NYA) | 1,024.00 |
| Jackson, Municipal Airport (CAA–WPA) | 393,523.00 |

**MONTANA**

| | |
|---|---|
| Billings, Municipal Airport (WPA) | 77,066.00 |
| Great Falls, Municipal Airport (WPA) | 6,896.00 |
| Helena, Municipal Airport (WPA) | 137,948.00 |

**NEBRASKA**

| | |
|---|---|
| Clay Center, Municipal Airport (WPA) | 7,363.00 |
| Fairbury, Municipal Airport (NYA) | 6,233.00 |

**NEVADA**

| | |
|---|---|
| Tonopah, Tonopah Airport (WPA) | 363,505.00 |

**NEW MEXICO**

| | |
|---|---|
| Deming, Municipal Airport (WPA) | 219,752.00 |
| Las Vegas, Municipal Airport (WPA) | 26,200.00 |

**NEW YORK**

| | |
|---|---|
| New York, LaGuardia Field (WPA) | 57,600.00 |

**NORTH DAKOTA**

| | |
|---|---|
| Valley City, Municipal Airport (WPA) | 67,626.00 |

**OHIO**

| | |
|---|---|
| Columbus, Port Columbus Airport (NYA) | 3,327.00 |
| Springfield, Municipal Airport (NYA) | 3,265.00 |

**OKLAHOMA**

| | |
|---|---|
| Cushing, Municipal Airport (WPA) | 52,689.00 |
| Stillwater, Searcy Airport (WPA) | 273,320.00 |

**OREGON**

| | |
|---|---|
| Medford, Municipal Airport (WPA) | 272,482.00 |
| Salem, Salem Airport (WPA) | 254,444.00 |

**PENNSYLVANIA**

| | |
|---|---|
| Williamsport, Williamsport Airport (CAA-WPA) | 280,809.00 |

**SOUTH CAROLINA**

| | |
|---|---|
| Florence, Municipal Airport (WPA) | 17,356.00 |

**SOUTH DAKOTA**

| | |
|---|---|
| Rapid City, Municipal Airport (WPA) | 236,324.00 |

**TEXAS**

| | |
|---|---|
| Beaumont, Municipal Airport (WPA) | 1,178,537.00 |
| Lubbock, Municipal Airport (WPA) | 16,474.00 |
| Nacogdoches, Nacogdoches Airport (WPA) | 365,382.00 |

**UTAH**

| | |
|---|---|
| Fillmore, Municipal Airport (NYA) | 5,136.00 |
| Manti-Ephraim, Manti-Ephraim Airport (NYA) | 3,640.00 |

**VIRGINIA**

| | |
|---|---|
| Danville, Municipal Airport (WPA) | 83,965.00 |
| Roanoke, Municipal Airport (WPA) | 2,040.00 |

## CAA Issues Bulletin on Airport Lighting

A revised edition of Civil Aeronautics Bulletin No. 10, AIRPORT LIGHTING, has been issued. Copies may be obtained from the Superintendent of Documents, Washington, D. C. The price is 15 cents.

The bulletin gives a comprehensive picture of the lighting systems of airports, according to present day standards, and explains the importance and function of each unit which goes to make up the complete lighting system.

## *Air Navigation Facilities on July 1*

***Radio Aids***

| | |
|---|---|
| Ranges (8 in Alaska, 2 in Hawaii) | 295 |
| Range stations simultaneous (8 in Alaska, 2 in Hawaii) | 193 |
| Range stations nonsimultaneous | 89 |
| Range stations, no voice | 13 |
| Broadcast stations (10 in Alaska, 2 in Hawaii | 118 |
| Broadcast stations simultaneous (8 in Alaska, 2 in Hawaii) | 115 |
| Broadcast stations nonsimultaneous (2 in Alaska) | 3 |
| Marker stations | 38 |
| Fan markers | 114 |
| Voice (only) stations (7 in Alaska) | 17 |
| Z markers (not at range stations) | 2 |

## Runways

(*Continued from page 175*)

4. Radio conversation between the control tower and the pilot is reduced considerably under the new system. Under the system which has been in general use, the control tower operator not only has to give the pilot the number of the runway but also the alignment of the runway before the pilot thoroughly understands which runway he is to use.

5. Under the old system it was necessary to renumber all runways, except the runway numbered "1," each time a new runway was constructed. The new system entirely eliminates this procedure.

In order that runway numbering may be uniform on all airports throughout the United States, airports which have numbered runways at the present time should paint out existing numbers which do not correspond to the magnetic bearing of the runway and replace them with numbers which correspond.

It is suggested that in painting over any existing numbers a good grade of aluminum paint be utilized, which will act as a seal and prevent the paint of the old numbers bleeding through the new numbers. Black paint may be used to block out the new numerals when necessary to cover portions of old numbers, or to provide greater contrast between the numerals and the pavement.

The paint used for the numbering should be of a good grade of highway marking paint, white or chrome yellow on a dark-surfaced runway, and Federal or chrome yellow on a light-surfaced runway. A luminous or reflecting paint may be used to increase visibility at night. On asphaltic runways, paints with an asphaltic base should be used.

## Part 13

(*Continued from page 179*)

vides that, effective August 1, 1941, each type of engine manufactured must undergo 150 hours of testing before it can be declared airworthy. Heretofore 50 hours have been sufficient. In addition to this increase in the duration of the tests, the procedures and conditions under which tests are made have been redefined. The amendment also specifies that manufacturers supply purchasers of engines with instruction books covering installation, operation, servicing, maintenance, repair, and overhaul of the engines.

The amendment is also designed to effect better cooperation between the Government, plane owners, and manufacturers in the improvement of aircraft engines. The action of the Board came after a conference between engine manufacturers and the Civil Aeronautics Administration showed that the change embodied in the amendment would be timely. Part 13 is headed AIRCRAFT ENGINE AIRWORTHINESS.

## Auto Gas

(*Continued from page 178*)

their assumption that automotive fuels are satisfactory on the premise that the octane rating, or antiknock qualities of the fuel, have a rating of around 73 to 75, which is true in some cases. Automotive fuels contain a certain percentage of cracked gasoline which is said to bring about a reduction in the octane rating when the fuel is stored for some time. The cracked content also brings about precipitation of gums and the formation of carbon which does not seem to affect seriously water-cooled automotive engines on which the cooling jackets and intake manifold systems operate at lower temperatures than would be the case on air-cooled aircraft engines. The higher operating temperatures of the latter appear to accelerate the formations of gum and carbon when the cheaper grades of cracked fuels found in some automotive fuels are burned in them, thereby creating a possibility of malfunctioning of the rings and valves."

One of the reasons for the additional cost of aviation fuels is that more attention is given to matching the various blends in order to obtain a "straight" chain of boiling points on the distillation chart, the bulletin continues. The fuel being tested is evaporated at a specific rate during the test and the temperatures at which the various percentages are distilled are plotted on the chart. A line drawn through the chain should have uniform shape indicating a straight slope of boiling characteristics of the fuel. The distillation test indicates a more uniform blending of aviation fuels and the "end" point or maximum temperature at which the remainder of the fuel boils off is lower than is found on automotive fuels. This means that heavier blends are used in automobile gasoline which are more likely to dilute the lubricating oil around the pistons and cause erratic performance of the engine, especially during starting or when it has been cooled off during a spin or long glide.

## *Status of Airports and Landing Fields by States, July 1, 1941*

**Airports and Landing Fields, Seaplane Bases and Anchorages**

| | Municipal | Commercial | Intermediate | Navy | Army | Miscellaneous Government | Private | Total | Lighted fields | Bases | Anchorages | Army | Navy | Coast Guard | Marine | Total | Partially lighted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 21 | 5 | 4 | | 4 | | | 34 | 14 | | 1 | | | | | 1 | |
| Arizona | 12 | 19 | 10 | | 1 | 2 | | 44 | 15 | | | | | | | 0 | |
| Arkansas | 13 | 8 | 3 | | | | | 24 | 7 | | 1 | | | | | 1 | |
| California | 66 | 77 | 17 | 4 | 7 | 7 | 4 | 182 | 52 | 4 | | | 3 | 2 | | 9 | 1 |
| Colorado | 25 | 7 | 3 | | 1 | | 1 | 37 | 9 | | | | | | | 0 | |
| Connecticut | 8 | 9 | 1 | | | | | 18 | 7 | 2 | 10 | | | 1 | | 13 | |
| Delaware | 2 | 6 | | | 1 | | | 9 | 1 | | | | | | | 0 | |
| District of Columbia | 1 | 1 | | 1 | 1 | | | 4 | 3 | | 1 | | 1 | | | 2 | 1 |
| Florida | 80 | 16 | 7 | 5 | 5 | | | 113 | 28 | 9 | 26 | | 4 | 2 | | 41 | 3 |
| Georgia | 32 | 5 | 11 | | 1 | | | 49 | 20 | 2 | | | | | | 2 | 1 |
| Idaho | 25 | 5 | 7 | | | 8 | 1 | 46 | 12 | | | | | | | | |
| Illinois | 14 | 46 | 6 | 1 | 2 | | 1 | 70 | 23 | 1 | 6 | | | | | 7 | |
| Indiana | 14 | 24 | 6 | | 2 | | | 46 | 15 | | 2 | | | | | 2 | |
| Iowa | 18 | 14 | 3 | | | | | 35 | 9 | | | | | | | 0 | |
| Kansas | 25 | 10 | 4 | | 2 | | | 41 | 15 | | | | | | | 0 | |
| Kentucky | 10 | 5 | 3 | | 1 | | | 19 | 4 | 1 | | | | | | 1 | |
| Louisiana | 15 | 6 | 4 | | 1 | | | 26 | 13 | 2 | 9 | | | | | 11 | 1 |
| Maine | 15 | 1 | | | | | | 16 | 5 | 3 | 20 | | | | | 23 | 1 |
| Maryland | 3 | 14 | | | 3 | | 1 | 21 | 4 | 2 | 1 | | 1 | | | 4 | 1 |
| Massachusetts | 9 | 28 | 1 | 1 | 2 | | 1 | 42 | 5 | 3 | 36 | | | 1 | | 40 | |
| Michigan | 85 | 21 | 1 | 1 | 3 | 3 | 5 | 119 | 17 | 1 | 28 | 1 | 1 | | | 31 | |
| Minnesota | 19 | 7 | 2 | | 1 | | | 29 | 9 | 2 | 5 | | | | | 7 | |
| Mississippi | 23 | 3 | 7 | | | | | 33 | 14 | | 2 | | | 1 | | 3 | 1 |
| Missouri | 11 | 15 | 11 | 1 | | | | 38 | 19 | | | | | | | 0 | |
| Montana | 43 | 2 | 15 | | | 13 | 2 | 75 | 21 | | 1 | | | | | 1 | |
| Nebraska | 29 | 10 | 5 | | 2 | | | 46 | 13 | | | | | | | 0 | |
| Nevada | 7 | 6 | 8 | | | 1 | | 22 | 10 | | 1 | | | | | 1 | |
| New Hampshire | 8 | 4 | | | | | | 12 | 3 | 1 | 5 | | | | | 6 | |
| New Jersey | 6 | 20 | | 3 | 1 | | | 30 | 7 | 3 | 1 | | 1 | | | 5 | 3 |
| New Mexico | 11 | 15 | 13 | | | | | 39 | 17 | | | | | | | 0 | |
| New York | 24 | 57 | 6 | 1 | 4 | 1 | 1 | 94 | 23 | 10 | 38 | 1 | 1 | 1 | | 51 | 2 |
| North Carolina | 12 | 18 | 2 | | 1 | 1 | | 34 | 11 | 1 | 6 | | | 1 | | 8 | |
| North Dakota | 20 | 1 | 9 | | | | | 30 | 10 | | | | | | | 0 | |
| Ohio | 27 | 65 | 11 | | 3 | | 3 | 109 | 28 | | 10 | | | | | 10 | 1 |
| Oklahoma | 23 | 20 | 7 | | 1 | | | 51 | 18 | | 2 | | | | | 2 | |
| Oregon | 19 | 4 | 6 | | | 1 | | 30 | 14 | 2 | | | 1 | | | 3 | 1 |
| Pennsylvania | 34 | 65 | 5 | 1 | 1 | | 1 | 107 | 28 | 2 | 6 | | 1 | | | 9 | 1 |
| Rhode Island | 1 | 3 | | | | | | 4 | 1 | | 2 | | 2 | | | 4 | |
| South Carolina | 13 | 9 | 4 | 1 | 1 | | 1 | 29 | 10 | | 4 | | | 1 | | 5 | 1 |
| South Dakota | 16 | 6 | 1 | | | | | 23 | 4 | | | | | | | 0 | |
| Tennessee | 10 | 3 | 8 | | | | | 21 | 13 | | | | | | | 0 | |
| Texas | 66 | 69 | 31 | 1 | 14 | | | 181 | 53 | 1 | 10 | | 1 | | | 12 | 1 |
| Utah | 14 | 2 | 10 | | | | | 26 | 16 | | | | | | | 0 | |
| Vermont | 9 | 2 | | | 1 | | | 12 | 1 | | 3 | | | | | 3 | |
| Virginia | 15 | 24 | 8 | 4 | 1 | | | 52 | 16 | | 1 | 1 | 2 | | 1 | 5 | |
| Washington | 30 | 6 | 7 | 2 | 4 | 4 | | 53 | 18 | 3 | 10 | | 2 | 1 | | 16 | |
| West Virginia | 9 | 11 | 2 | | 1 | | | 23 | 4 | 2 | 1 | | | | | 3 | |
| Wisconsin | 23 | 20 | 3 | | 1 | | | 47 | 15 | 2 | 17 | | | | | 19 | |
| Wyoming | 20 | 1 | 10 | | | | 1 | 32 | 15 | | | | | | | 0 | |
| Total | 1,035 | 795 | 282 | 27 | 74 | 41 | 23 | 2,277 | 690 | 59 | 266 | 3 | 21 | 11 | 1 | 361 | 20 |

# Best Lighted in World, Say Engineers Of Washington National Airport; Design and Efficiency Praised

## Plane Traffic Control Before, After Landing Draws Most Comment

"The best lighted airport in the world."

This is the opinion of members of the Illuminating Engineering Society which recently held a night meeting at the Washington National Airport.

New use of lights in handling airplane traffic at the airport before and after landing caused most of the comment, and Francis C. Breckinridge, physicist of the Bureau of Standards, who visited every principal airport in Europe in 1939, declared that this installation is years ahead in design and efficiency.

"I found no air ministries anywhere who had any idea of plane traffic control by means of lights," he said, "There are bigger airports than this in Europe, and some managers are looking, as we are, to the day when parallel runways will be necessary, but no provisions have been made for the more complicated handling of traffic under these conditions."

Lighting of this "world's finest commercial airport" was worked out by the Technical Development Division of the Civil Aeronautics Administration, in cooperation with Westinghouse Electric & Manufacturing Co., and the veteran aviation men of that Division called on all their years of experience in flying and airport construction and operation in designing the landing field.

If all radio communications between plane and ground should be ended, planes could still be controlled from the airport tower by lights for safety in landing, taxiing or taking-off. This is accomplished by a system of red and green traffic signals, consisting of the familiar round red or green traffic light, an 80-foot arrow in green neon, and an 80-foot red cross in red neon. As a plane approaches, the control tower operator prepares the necessary directing lights to tell the pilot which runway to use and whether to land at once or circle the field and await further instructions. These are all turned on at once by a master switch.

Even should the lights become inoperative, the approaching plane could land by means of still another safety precaution—the reflecting runway markers, supplied by the Prismo Paint Co. These consist of 6-inch wide lines of long-wearing paint into which have been set tiny glass beads to reflect the lights of the plane, one triple line at each side and double lines in the center of the runway. At a point 1,000 feet from the end of the runway, several short parallel lines are painted to inform the pilot of the proximity of the end of the runway. On each end of each runway, the compass bearing of that runway is painted in letters 50 feet high and 25 feet wide and the taxi routes and positioning lines at the loading stations are also painted in the same material. In the darkness, these prisms reflect so much light as to mark all runways adequately for safe landing.

If the green traffic arrow is burning, the pilot lands over it along the runway that is bordered by white lights every 200 feet. The last 1,500 feet of the runway has orange lights instead of white to inform the pilot of his nearness to the runway end. At the end of the runway he sees a string of faint blue lights which lead him in the most direct route along taxi strips to the loading area. Where this taxi strip crosses runways, there are red and green lights so that the pilot can be stopped if there is danger in crossing.

A plane which has taxied to the point of take-off is held in position by a red stop light until the runway is safe for use. Then the flashing red cross warns approaching planes that the runway is in use, and the green light at each end of the runway tells the pilot on the ground to take-off. Thus the tower man can move planes about on the airport and above the airport like players on a checkerboard, aided by the use of lights as well as the usual radio equipment.

The switchboard in the control tower is a lay-out of the field, with runways and switches coated with fluorescent paint so that they glow softly under a "black light," protecting the eyes of the operator.

Another aid to landing is provided by placing an automatic smokepot at each end of each runway to give the approaching pilot information on the direction and velocity of wind at the surface. The white smoke is visible against the black runway in the daytime and illuminated by the standard floodlights at night.

## Correction

Because of a typographical error, some of the statistics appearing in Table E, "Comparative Figure in Vital Statistics and Results of Accidents in Domestic Scheduled Air Carrier Operations for the July-December Periods for the Years 1936 through 1940" on page 146, CIVIL AERONAUTICS JOURNAL, Vol. 2, No. 12, dated June 15, 1941, were incorrect. A correct version of that portion of the table which was in error is reprinted below. (The incorrect figures were those for the average of the five periods.)

## 14 Airports To Complete Ground Helper Courses

Fourteen airports will complete their airport servicemen's training program during July, bringing the total of such courses completed to 32 by the end of

(See HELPERS, *page 187*)

| | July–December 1936 | July–December 1937 | July–December 1938 | July–December 1939 | July–December 1940 | Average for the 5 periods |
|---|---|---|---|---|---|---|
| II. Damage to material: | | | | | | |
| Airplanes: | | | | | | |
| Completely demolished, class A | 7 | 2 | 3 | 0 | 3 | 3.0 |
| Complete overhaul, class B | 7 | 3 | 4 | 3 | 4 | 4.2 |
| Major assembly repairs, class C | 12 | 11 | 8 | 12 | 5 | 9.0 |
| Minor repairs, class D | 1 | 1 | 6 | 1 | 12 | 4.2 |
| III. Nature of accident: | | | | | | |
| Collision (see definition), class A | 0 | 0 | 0 | 0 | 0 | .0 |
| Collision (see definition), class B | 4 | 1 | 1 | 0 | 2 | 1.6 |
| Spins or stalls (engine failure), class C | 0 | 0 | 0 | 0 | 0 | .0 |
| Spins or stalls (not engine failure), class D | 0 | 0 | 0 | 0 | 0 | .0 |
| Forced landings, class E | 2 | 0 | 1 | 1 | 2 | 1.2 |
| Landing accidents, class F | 9 | 5 | 6 | 7 | 16 | 8.6 |
| Take-off accidents, class G | 0 | 2 | 2 | 1 | 0 | 1.0 |
| Taxiing accidents, class H | 10 | 4 | 5 | 4 | 3 | 5.2 |
| Fires in the air, class I | 0 | 0 | 1 | 1 | 0 | .4 |
| Structural failures, class N | 0 | 4 | 2 | 1 | 0 | 1.4 |
| Miscellaneous, class X | 0 | 1 | 0 | 0 | 0 | .2 |
| Indeterminate and doubtful, class Y | 1 | 0 | 0 | 0 | 0 | .2 |
| Miscellaneous information: | | | | | | |
| Fires after accident | 1 | 0 | 0 | 0 | 0 | .2 |
| Propeller accidents to persons | 0 | 0 | 0 | 1 | 0 | .2 |

CIVIL AERONAUTICS BOARD

# OFFICIAL ACTIONS

## Abstracts of Opinions, Orders, and Regulations

FOR THE PERIOD JUNE 15–30, 1941

## ORDERS

ORDER No. 1088..... June 16, 1941

Dismissed application of Eastern Air Lines, Inc., for an order authorizing temporary suspension of service at Mobile, Ala., on route No. 5.

ORDER No. 1089..... June 16, 1941

Dismissed application of National Airlines, Inc., for an order authorizing temporary suspension of service at Mobile, Ala., on route No. 39.

ORDER No. 1090..... June 17, 1941

Suspended for 90 days student pilot certificate No. S–212183, held by Henry Marchant Sessions, II, for piloting an aircraft over congested area at altitude insufficient to permit emergency landing outside of such area and other violations of Civil Air Regulations.

ORDER No. 1091..... June 17, 1941

Directed Ernest A. Williams, Graniteville, S. C., to appear before an examiner of the Board and show cause why his private pilot certificate No. 40997 should not be suspended or revoked for piloting an aircraft on a civil airway carrying passengers for hire and other violations of Civil Air Regulations.

ORDER No. 1092..... June 17, 1941

Granted United Air Lines Transport Corporation permission to inaugurate service to Youngstown, Ohio, route No. 1, through use of Youngstown Municipal Airport on July 1, 1941.

ORDER No. 1093..... *June 17, 1941*

Consolidated for the purpose of hearing applications of Transcontinental & Western Air, Inc., Chicago & Southern Air Lines, Inc., and Eastern Air Lines, Inc., for certificates and amendments of existing certificates of public convenience and necessity.

ORDER No. 1094..... *June 17, 1941*

Consolidated for the purpose of hearing applications of National Airlines, Inc., Delta Air Corporation, Braniff Airways, Inc., Eastern Air Lines, Inc., and Chicago & Southern Air Lines, Inc., for certificates and amendment of an existing certificate of public convenience and necessity.

ORDER No. 1095..... *June 17, 1941*

Granted American Airlines, Inc., permission to intervene in application of Transcontinental & Western Air, Inc., for certificate of public convenience and necessity authorizing air transportation between Dayton, Ohio, and Washington, D. C.

ORDER No. 1096..... *June 17, 1491*

Granted Pennsylvania-Central Airlines Corporation permission to intervene in application of Transcontinental & Western Air, Inc., for certificate of public convenience and necessity authorizing air transportation between Dayton, Ohio, and Washington, D. C.

ORDER No. 1097..... *June 17, 1941*

Granted Eastern Air Lines, Inc., permission to intervene in application of Transcontinental & Western Air, Inc., for certificate of public convenience and necessity authorizing air transportation between Dayton, Ohio, and Washington, D. C.

ORDER No. 1098..... *June 17, 1941*

Granted American Airlines permission to inaugurate service to Windsor, Ontario, on route No. 7 through use of Windsor Airport on June 24, 1941.

ORDER No. 1099..... *June 17, 1941*

Granted American Airlines permission to inaugurate service to Toronto, Ontario, on route No. 56 through use of Malton Airport on June 24, 1941.

ORDER No. 1101..... *June 18, 1941*

Consolidated for purpose of hearing applications of United Air Lines Transport Corporation and Transcontinental & Western Air, Inc., for certificates of public convenience and necessity.

ORDER No. 1101..... *June 18, 1941*

Granted Public Counsel additional time to answer memorandum brief filed by Herbert W. Susott, holder of airline transport pilot certificate No. 12166.

ORDER No. 1102..... *June 17, 1941*

Revoked student pilot certificate No. S–23535, held by Carroll W. Wallis, Portland, Oreg., for piloting an aircraft at altitude of less than 500 feet over open country and other violations of Civil Air Regulations (opinion and order—Docket No. SR–61).

ORDER No. 1103..... *June 19, 1941*

Amended Order, Serial No. 19, so as to grant Canadian Colonial Airways, Inc., exemption from certain provisions of the Act until September 30, 1941, by authorizing it to originate and terminate flights at Burlington, Vt.

ORDER No. 1104..... *June 20, 1941*

Revoked student pilot certificate No. S–13506, held by Ray Smith, Rifle, Colo., for piloting an aircraft carrying passengers other than a certificated instructor and other violations of Civil Air Regulations.

ORDER No. 1105..... *June 20, 1941*

Revoked parachute rigger certificate No. 701, held by Loren Douglass Newton, Pittsburgh, Pa., for inspecting, repacking and certifying as airworthy a parachute when it was in fact unairworthy, in violation of Civil Air Regulations.

ORDER No. 1106..... *June 21, 1941*

Granted the application of Continental Air Lines, Inc., for amendment to its

## C. A. B. Opinions

The first 26 individually-printed opinions of the Civil Aeronautics Board in economic cases are now available. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each. Titles of the latest opinions to be printed are as follows:

No. 17: TRANS-SOUTHERN AIRLINES, INC. ET AL.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, Docket No. 12–401 (B) 1.

No. 18: PENNSYLVANIA-CENTRAL AIRLINES CORPORATION,—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, Docket No. 242.

No. 19: BRANIFF AIRWAYS, INC. ET AL.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Kansas City-Memphis Route*), Docket No. 195.

No. 20: PAN AMERICAN-GRACE AIRWAYS, INC.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, Docket No. 459.

No. 21: BOSTON-MAINE AIRWAYS, INC.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Bangor-Moncton Operations*), Docket No. 290.

No. 22: LOCKHEED AIRCRAFT CORPORATION ET AL.—ACQUISITION OF UNITED AIRPORTS COMPANY, Docket No. 507.

No. 23: URABA, MEDELLIN AND CENTRAL AIRWAYS, INC.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Canal Zone-Central Colombia Operation*), Docket No. 28—401–E–1.

No. 24: INLAND AIRLINES, INC.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Alliance, Nebr., Operation*), Docket No. 438.

No. 25: BRANIFF AIRWAYS, INC. ET AL.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Houston - Memphis - Louisville Route*), Docket No. 1–401–B–1.

No. 26: MID-CONTINENT AIRLINES, INC.—MAIL RATE FOR ROUTE No. 48, Docket No. 451.

certificate of public convenience and necessity for route No. 43 so as to authorize air transportation between Wichita, Kans., and Tulsa, Okla.; denied applications of Braniff Airways, Inc., Kansas City Southern Transport Co., Inc., and Mid-Continent Airlines, Inc., for certificates of public convenience and necessity (opinion and order—Dockets 192, 251, 309, 310).

ORDER NO. 1107 ..... *June 24, 1941*

Suspended for 180 days private pilot certificate No. 75626–41, held by Charles Arthur Shaw, Missouri City, Mo., for piloting an aircraft acrobatically over airport at altitude of approximately 200 feet, and other violations of Civil Air Regulations.

ORDER NO. 1108 ..... *June 24, 1941*

Suspended for 60 days student pilot certificate No. 204178, held by Malcolm H. Cowan, Houston, Tex., for permitting uncertificated pilot to fly his certificated aircraft and other violations of Civil Air Regulations.

ORDER NO. 1109 ..... *June 24, 1941*

Directed withheld from public disclosure 22 pages of testimony in the proceeding to determine the fair and reasonable rates of compensation for transportation of mail by Pan American Airways Co. (Nev.) between San Francisco and Hong Kong and between San Francisco and Auckland, New Zealand.

ORDER NO. 1110 ..... *June 24, 1941*

Granted permission to United Air Lines Transport Corporation to inaugurate on July 1, 1941, nonstop service between Cleveland and Youngstown, Ohio, and between Philadelphia, Pa., and Youngstown, Ohio, on route No. 1; and between Boise, Idaho, and Portland, Oreg., on route No. 12.

ORDER NO. 1111 ..... *June 24, 1941*

Approved cancellation of agreement between Chicago & Southern Air Lines, Inc., and American Airlines, Inc., fixing flying time between common points (previous order No. 969).

ORDER NO. 1112 ..... *June, 20, 1941*

Revoked aircraft and aircraft engine mechanic certificate No. 8553 held by Harold W. Shangle, Portland, Oreg., for certifying an aircraft as airworthy when in fact it was not (opinion and order).

ORDER NO. 1113 ..... *June 26, 1941*

Granted Pennsylvania-Central Airlines Corporation permission to serve Asheville, N. C., an intermediate point on route No. 51, through use of Asheville-Hendersonville Airport on June 28, 1941.

ORDER NO. 1114 ..... *June 26, 1941*

Directed that the petition of Elizabeth City, N. C., requesting that it be included as a stop on route No. 51 operated by Pennsylvania-Central Airlines Corporation be set down for hearing to determine whether public convenience and necessity require such air transportation, and made Elizabeth City and Pennsylvania-Central Airlines Corporation parties to the proceeding.

ORDER NO. 1115 ..... *June 27, 1941*

Amended order (serial No. 706) as amended, so as to authorize the temporary suspension of service by Eastern Air Lines, Inc., at Spartanburg, S. C., on route No. 5, through December 31, 1941.

ORDER NO. 1116 ..... *June 27, 1941*

Suspended for 60 days private pilot certificate No. 7588–40 held by Robert E. Williams, Jr., Schenectady, N. Y., for piloting an aircraft after sunset when said aircraft was not equipped with proper navigation lights, and other violations of Civil Air Regulations.

ORDER NO. 1117 ..... *June 27, 1941*

Amended order (serial No. 1022) so as to authorize the temporary suspension of service by Pennsylvania-Central Airlines Corporation, at Saginaw-Bay City, Mich., on route No. 41, through October 31, 1941.

ORDER NO. 1118 ..... *June 27, 1941*

Revoked student pilot certificate No. S–149503 held by Anthony Kwiatkowski, East Chicago, Ind., for piloting an aircraft carrying a passenger other than certificated instructor, and other violations of Civil Air Regulations.

ORDER NO. 1119 ..... *June 28, 1941*

Amended order (serial No. 1013) which authorized temporary suspension of service by American Airlines, Inc., between Hartford, Conn., and points on route No. 21 west of Hartford, by extending the suspension date from June 30, 1941, to July 31, 1941.

ORDER NO. 1120 ..... *June 30, 1941*

Amended order (serial No. 684) as amended, temporarily exempting Pan American-Grace Airways, Inc., from certain provisions of the Civil Aeronautics Act, so as to continue said order in effect until September 30, 1941.

ORDER NO. 1121 ..... *June 30, 1941*

Amended order (serial No. 685) as amended, temporarily exempting Pan American Airways, Inc., from certain provisions of the Civil Aeronautics Act, so as to continue said order in effect until September 30, 1941.

## REGULATIONS

REGULATION NO. 169 ..... *June 20, 1941*

Adopted Amendment No. 119 of the CAR, LANDING AND TAKE-OFF RULES, amending part 60. The full text follows:

Effective June 20, 1941, the Civil Air Regulations are amended:

1. By amending section 60.330 to read as follows:

"*60.330. Procedure for taking off and landing.*

"*60.3300.* A take-off shall not be commenced until there is no risk of collision with other aircraft during such take-off.

"*60.3301.* Aircraft approaching for a landing shall circle the airport or other landing area sufficiently to observe other traffic, unless the pilot receives other instructions from the air-traffic control-tower operator. All circles, either approaching for a landing or after take-off, shall be made to the left unless the pilot receives other instructions from the air-traffic control tower operator, or unless the Board has prescribed, in the interests of safety, a different procedure for the particular airport or landing area.

"*60.3302.* Aircraft approaching for a landing shall, unless impracticable, maintain a straight approach course for the last 1,000 feet before crossing the airport boundary.

"*60.3303.* Aircraft making contact flights within 3 miles horizontally of the center of an airport or landing area shall conform to the circle rule provided in section 60.3301 unless flying at an altitude in excess of 3,000 feet above the ground or water.

"*60.3304.* Air traffic departing from or arriving at a control airport shall take precedence over other air traffic within the control zone of such airport when required in the interests of safety."

REGULATION NO. 170 ..... *June 24, 1941*

Adopted Amendment No. 120 of the CAR, MINIMUM AND MAXIMUM ALTITUDES OF FLIGHT AND WEATHER MINIMUMS, amending parts 60 and 61. The full text follows:

Effective July 1, 1941, parts 60 and 61 of the Civil Air Regulations are amended as follows:

1. By amending section 60.35 to read as follows:

"*60.35. Minimum and maximum safe altitudes of flight.*

"*60.350. Minimum safe altitudes.*—Exclusive of taking-off from or landing upon an airport or other landing area aircraft shall not be flown below the following minimum safe altitudes of flight:

"*60.3500.* An altitude over the congested parts of cities, towns, or settlements, sufficient to permit at all times an emergency landing outside of such areas in the event of complete power failure, but in no case less than 1,000 feet above the ground.

"*60.3501.* An altitude over an area certified by the Administrator as a danger area sufficient to permit at all times an emergency landing outside of such danger area in the event of complete power failure but in no case less than 1,000 feet above the ground: *Provided*, That the restrictions of this paragraph shall not apply to public aircraft previously authorized by the appropriate governmental agency to make specific flights below such minimums in the public interest.

"*60.3502.* 1,000 feet above the ground over any Federal penal institution or any open air assembly of persons.

"*60.3503.* 500 feet above the ground or water elsewhere than as specified in §§ 60.3500, 60.3501, and 60.3502, or within 500 feet from any mountain, hill or other obstruction to flight, except as may be specifically approved by the Administrator: *Provided, however*, That seaplanes and amphibians may be flown below 500 feet, but not below 300 feet, if making a contact flight during daylight hours over open water and where an emergency landing may, at all times, be made, without the aid of power, into the wind and without danger of collision with craft on the surface or other obstructions: *And provided, further*, That the restrictions of this paragraph shall not apply to public aircraft, previously authorized by the appropriate governmental agency to make specific flights below such minimums in the public interest.

"*60.3504.* 1,000 feet above the ground or water, or within 1,000 feet of any mountain, hill or other obstruction to flight, if an aircraft is making an instrument flight as defined in § 60.131.

"*60.3505.* Any maneuver required in student instruction or solo practice under the supervision of a certificated flight instructor, the Army, Navy, Marine Corps, or Coast Guard, or in flight tests given by an inspector of the Administrator, may be conducted at the altitude above the ground or water necessary for the proper execution of such maneuver in

places other than as specified in §§ 60.3500, 60.3501, and 60.3502.

*"60.351. Maximum safe altitude.*—Aircraft, except military aircraft, shall not be flown at altitudes above 17,000 feet above sea level: *Provided, however,* That air carrier aircraft in scheduled air transportation may operate above that altitude when authorized by the terms of the competency letters issued to the air carrier: *And provided, further,* That the Administrator may authorize flights of aircraft above that altitude when necessary in the interests of safety or the development of aeronautics.

*"60.3510.* Military aircraft when operating above 17,000 feet above sea level must be equipped with two-way radio equipment adequate to communicate at all times with either a ground radio station maintained by one of the armed forces of the United States or with an airway communications station of the Administrator. Such aircraft shall obtain a clearance from the appropriate airway traffic control center of the Administrator before ascending to or descending from that altitude if during such ascent or descent the aircraft enters into or passes through an airway traffic control area.

*"60.3511.* Military aircraft while operating either contact or on instruments above the altitude of 17,000 feet above sea level in accordance with the provisions of § 60.351 shall be exempt from all other provisions of this part except that such aircraft shall comply with the airplane light rules of § 60.61 and when flying along or crossing routes or civil airways approved for use by a scheduled air carrier authorized to operate above 17,000 feet, such military aircraft shall comply with the following flight altitudes:

"(a) *Eastbound flights.*—Aircraft making good a true course of 0° (or 360°) to, but not including, 180° shall fly at an ODD thousand-foot level plus 500 feet, above sea level (such as 17,500, 19,500, or 21,500 feet); and

"(b) *Westbound flights.*—Aircraft making good a true course of 180° to, but not including, 360° (or 0°) shall fly at an EVEN thousand-foot level plus 500 feet, above sea level (such as 18,500, 20,500, or 22,500 feet)."

2. By amending section 60.44 to read as follows:

*"60.44 Weather minimums.*—The following weather minimums shall govern flight made in accordance with contact flight rules: *Provided, however,* That an airway traffic control center of the Administrator may for reasons of safety restrict or suspend contact flight operation within the airway traffic control area of such center: *Provided, further,* That in the interests of safety the Administrator may require higher minimums at any particular control airport, and that such minimums shall govern the control zone in which such control airport lies.

*"60.440. Within control zones.*—Aircraft shall not be flown within a control zone unless the ceiling is at least 1,000 feet and the visibility is at least 3 miles: *Provided, however,* That a certificated air-traffic control tower operator on duty in a radio-equipped airport control tower may authorize flight at altitudes of 1,000 feet or less above the ground or water when the visibility is less than 3 miles but not less than 1 mile: *And provided, further,* That such operator may suspend contact flight operation within the control zone when reasons of safety require such actions.

*"60.441. Outside of control zone.*

*"60.4410. At or below 1,000 feet.*—Aircraft shall not be flown at or below 1,000 feet above the ground or water unless the ceiling is sufficient to permit flight at the minimum altitude prescribed in § 60.35 and unless the visibility during the hours of daylight is at least 1 mile and during the hours of darkness is at least 2 miles.

*"60.4411. Above 1,000 feet.*—Aircraft shall not be flown above 1,000 feet above the ground or water unless the ceiling is sufficient to permit flight at the minimum altitude prescribed in § 60.35 and unless the visibility is at least 3 miles at flight altitude.

*"60.442. Proximity to cloud formation.*—Aircraft shall not be flown closer than 500 feet vertically to an overcast or cloud formation nor closer than 2,000 feet horizontally to a cloud formation."

3. By amending section 61.742 to read as follows:

*"61.742. Maximum altitude of flight operations.*—No scheduled air carrier aircraft shall be operated at altitudes above 17,000 feet above sea level unless specifically permitted by the terms of the competency letters issued to the air carrier. A competent cabin attendant to care for passengers shall be provided on all air carrier flights carrying passengers operating for any period of time above 12,000 feet above sea level."

4. By amending the table of contents of part 60 by striking "60.35. Minimum safe altitudes" and inserting in lieu thereof "60.35. Minimum and maximum safe altitudes of flight."

REGULATION NO. 171.....*June 24, 1941*

Adopted Amendment No. 121 of the CAR, CONTACT FLIGHT ABOVE 3,500 FEET ON CIVIL AIRWAY, amending part 60. The full text follows:

Effective July 1, 1941, the Civil Air Regulations are amended:

1. By amending section 60.471 to read as follows:

*"60.471. Contact flight above 3,500 feet on civil airway.*—In addition to all contact flight rules, aircraft flying under contact conditions at an altitude of more than 3,500 feet above the ground or water and within the limits of a civil airway shall conform to the rules prescribed for flight under instrument conditions in the following respects:

"(1) Compliance with section 60.53, *Flight plans,* when flights touch airway traffic control areas;

"(2) Maintenance of flight altitudes (§ 60.58); and

"(3) Maintenance of communication contacts (§ 60.571).

*"60.4710. Equipment.*—In addition to the equipment required by § 60.41 all such aircraft shall be equipped with a radio receiver as specified in § 04.512 (e), a radio transmitter capable of maintaining communication with an airway communications station of the Administrator under normal conditions, and a sensitive altimeter as specified in § 04.513 (d).

*"60.4711. Communication failure.*—In the event of the failure of two-way communication equipment on such aircraft the pilot shall immediately either leave the airway or descend to an altitude below 3,500 feet above the ground or water."

2. By amending section 60.43 to read as follows:

*"60.43. Flight plan.*—A flight plan is not required unless the flight is made above 3,500 feet above the ground or water within the limits of a civil airway as specified in § 60.471."

3. By striking section 60.472.

4. By striking section 60.48 and by striking from the table of contents of part 60 the following:

*"60.48. Flight altitudes."*

## Accident Reports

(*Continued from page 177*)

high altitude while it climbed to a height of about 200 feet where the pilot made a right turn with the airplane still held in this near-stalling position. After flying 1 mile farther, the pilot started another right turn. The airplane stalled at an altitude of about 300 feet during the turn and fell off into a spin which continued until it struck the ground. The wreckage caught fire upon impact, and burned.

The direction of the take-off into a south-southeast wind of estimated 8 m. p. h. velocity was toward rising terrain just beyond the airport boundary.

*Probable cause.*—Pilot stalled the airplane during a turn at low altitude.

*Contributing factor.*—Faulty piloting technique in failing to acquire and maintain adequate flying speed before and following take-off.

## Collision in the Air

Failure of pilots of two aircraft to observe and avoid the other aircraft in flight caused the accident over Phoenix, Ariz., on May 19, 1940, in which Private Pilot Mrs. Grace Anderson and her passenger, Mrs. Homer Norton, were fatally injured.

Mrs. Anderson had logged 280 hours' flying experience and was flying a Monocoupe 90 at the time of the accident. The pilot of the other plane involved, a Cessna C–38, was Ernest Montgomery, who held a commercial certificate and had logged 250 hours. The Cessna carried three passengers, two paying and one nonpaying.

## Statistical Summary

(*Continued foom page 180*)

1941 period over the 1940 period was 26.25 percent in revenue miles, and 37.24 percent in revenue passengers.

The express pound-miles flown by domestic airlines in May 1941 totaled 814,617,980, a 55.81 percent increase over the 522,817,135 total for May 1940. In April 1941 the number of air express pound-miles flown was 726,191,800. The total in this classification for the first 5 months of 1941 was 3,471,304,846, an increase of 43.11 percent over the total for a corresponding period of 1940, which was 2,425,625,696.

Similar gains were reported in the pounds of air express carried. The May 1941 figure was 1,462,121, a 55.25 percent increase over the May 1940 total of 941,810, and a smaller increase over the April 1941 total of 1,352,181. During the first 5 months of this year 6,251,473 pounds of express were carried by the airlines, as against 4,222,726 pounds during the first 5 months of 1940, representing a gain of 48.04 percent.

The May revenue passenger load factor this year was 59.56 percent, compared with 60.04 percent in May 1940, and 56.59 percent in April 1941. For the first 5 months of 1941 it was 53.39 percent, as against 56.95 percent for the first 5 months of 1940.

## Helpers

(*Continued from page 184*)

the month. The program is part of a Nation-wide project sponsored by the Office of Education and the Civil Aeronautics Administration for the training of airport ground helpers.

Classes will be completed this month at the following airports: Logan Field, Baltimore, Md.; Cub Haven, Lock Haven, Pa.; Cannon, Charlotte, N. C.; Central Jersey, Hightstown, N. J.; El Paso Municipal, El Paso, Tex.; Houston Municipal, Houston, Tex.; New Orleans, New Orleans, La.; West Mesa, Albuquerque, N. Mex.; Adams Field, Little Rock, Ark.; Meacham Field, Fort Worth, Tex.; Oklahoma Municipal, Oklahoma City, Okla.; Stinson Field, San Antonio, Tex.; Tulsa Municipal, Tulsa, Okla.; English and Amarillo Municipal, Amarillo, Tex.

# Status of Parts of the Civil Air Regulations and Amendments

*As of July 1, 1941*

All persons affected by the Civil Air Regulations, including those preparing for examinations for certificates, may obtain required Parts of the Regulations from the Publications and Statistics Division, Civil Aeronautics Administration, Washington, D. C., without charge.

**ONLY PARTS NEEDED SUPPLIED FREE**

For example, *pilots* are governed in general by Parts 01., 20., 60., and 98; *aircraft mechanics* by Parts 01., 04., 15., 18., 24., 98., and Section 60.32; and *aircraft engine mechanics* by Parts 01., 04., 13., 14., 18., 24. and 98. It should be remembered that individuals are entitled to receive free of charge only those portions of the C. A. R. which directly govern the activity in which they are engaged.

**HOW TO OBTAIN PARTS, AMENDMENTS, AND MANUALS**

Those persons not affected by the C. A. R., but desiring all or any part of the Regulations for other purposes, may obtain them as follows: Those Parts on which a price is listed in the tabulation below are on sale by the Superintendent of Documents, U. S. Government Printing Office (shown as G. P. O. in table), Washington, D. C., and are not available for free distribution except as stated in the first paragraph.

Eventually, all Parts will be placed on sale; meanwhile, Parts not yet on sale (carrying remark in tabulation below "order from C. A. A. only") may be obtained without charge from the C. A. A. upon demonstration of valid interest on the applicant's part.

ALL AMENDMENTS TO THE CIVIL AIR REGULATIONS, AND NOTICE OF NEW PARTS, ARE PRINTED IN THE OFFICIAL ACTIONS SECTION OF THE CIVIL AERONAUTICS JOURNAL, AS RELEASED.

The tabulation below carries in the right-hand column the numbers of all effective amendments to each Part issued subsequent to its publication. Parts ordered from C. A. A. include all effective amendments, but when Parts are purchased from G. P. O. amendments must be requested separately from C. A. A.

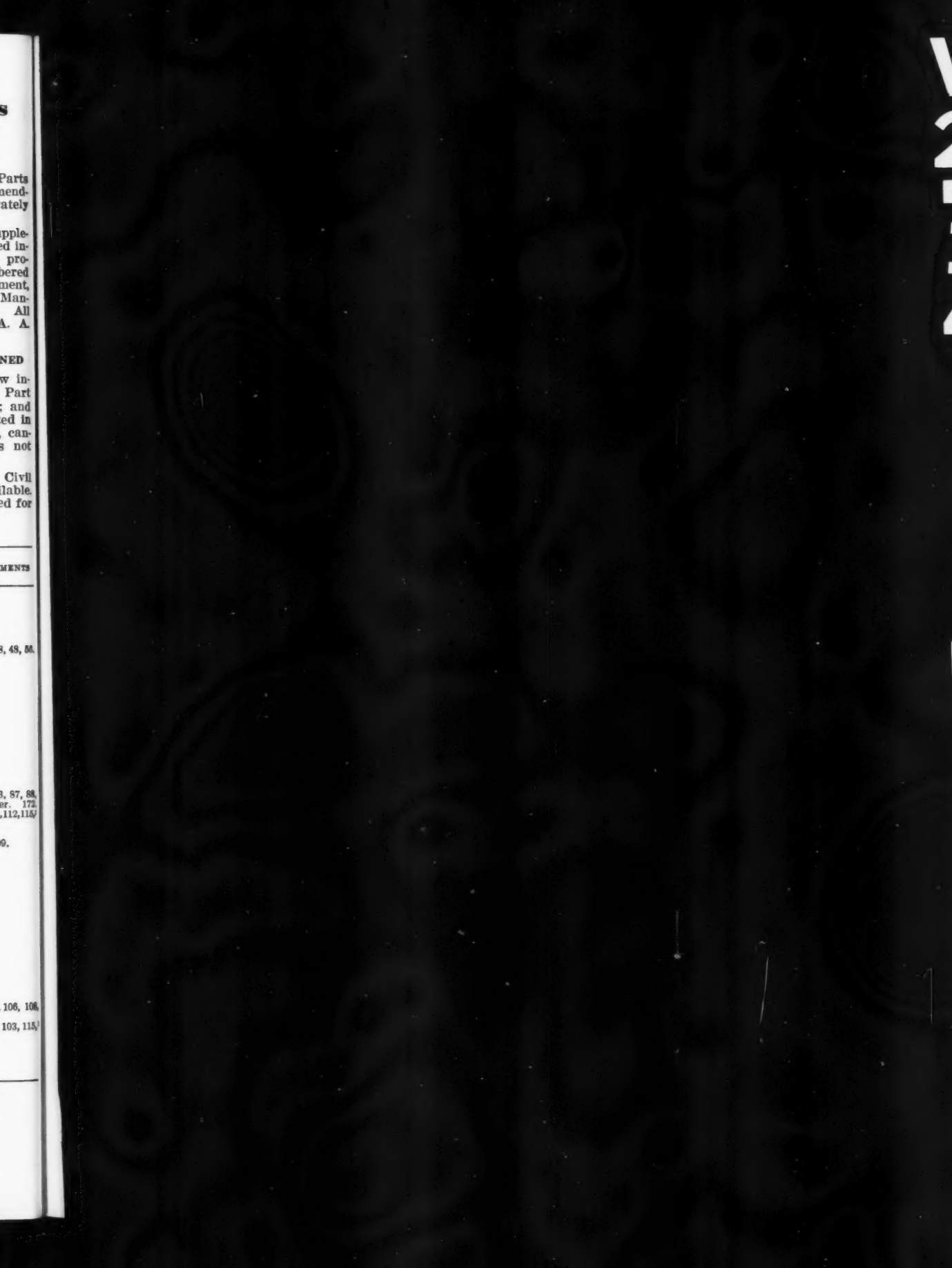
Civil Aeronautics Manuals supplementing certain Parts with detailed interpretations of their respective provisions are issued. They are numbered the same as the Parts they supplement, and those Parts accompanied by Manuals carry appropriate notations. All Manuals are obtained from C. A. A. only, without charge.

**PARTS CANCELLED AND UNASSIGNED**

Cancelled Parts 00. and 03. now incorporated in Part 01.; cancelled Part 23. now incorporated in Part 51.; and cancelled Part 25. now incorporated in Part 24. Parts 90.–96., inclusive, cancelled. All other Part numbers not shown are unassigned.

Bound volumes of the complete Civil Air Regulations are no longer available. Parts and amendments are punched for filing in loose-leaf binders.

| Part No. | Title | Date | Remarks | Price | Effective Amendments |
|---|---|---|---|---|---|
| | **AIRCRAFT** | | | | |
| 01 | Aircraft Registration and Airworthiness Certificates. | 6-1-41 | In stock at C. A. A. and on sale at G. P. O. | $0.05 | |
| 02 | Type and Production Certificates | 3-1-41 | In stock at C. A. A. and on sale at G. P. O. | .05 | |
| 04 | Airplane Airworthiness (Manual 04, 2-1-41.[3]) | 5-31-38 | Out of stock; to be available soon at C. A. A. and on sale at G. P. O. | .05 | 601-A-1, 5, 14, 26, 28, 43, 56, 75, 85, 98, 116.[1] |
| 13 | Aircraft Engine Airworthiness (Manual not issued). | 11-15-40 | In stock; order from C. A. A. only | | 116.[1] |
| 14 | Aircraft Propeller Airworthiness (Manual 14, 12-1-38). | 11-15-40 | In stock; order from C. A. A. only | | |
| 15 | Aircraft Equipment Airworthiness (Manual 15, 7-1-38). | 11-15-40 | In stock; order from C. A. A. only | | |
| 16 | Aircraft Radio Equipment Airworthiness (Manual, 2-13-41). | 2-13-41 | In stock at C. A. A. and on sale at G. P. O. | .05 | |
| 18 | Maintenance, Repair, and Alteration of Certificated Aircraft and of Aircraft Engines, Propellers, and Instruments. (Manual 18, not yet published.) | 6-1-41 | In stock; order from C. A. A. only | | |
| | **AIRMEN** | | | | |
| 20 | Pilot Certificates | 5- 1-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 63, 65, 67, 75, 82, 83, 87, 88, Spec. Reg. Ser. 172, 99, 101, 107, 110, 111, 112, 115, 117, 118. |
| 21 | Airline Transport Pilot Rating | 11-15-40 | In stock; order from C. A. A. only | | 87, 101, 115.[1] |
| 24 | Mechanic Certificates | 5- 1-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 44, 61, 73, 75, 87, 109. |
| 26 | Air-Traffic Control-Tower Operator Certificates | 10-4-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 87. |
| 27 | Aircraft Dispatcher Certificates | 7-15-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 74, 75, 87. |
| | **AIR CARRIERS** | | | | |
| 40 | Air Carrier Operating Certification (Interstate) | 11-1-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 85, 89, 102. |
| | **AIR AGENCIES** | | | | |
| 50 | Flying School Rating (Manual 50, 12-40[4]) | 11-1-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 87, 113. |
| 51 | Ground Instructor Rating | 5-1-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 75, 87. |
| 52 | Repair Station Rating (Manual 52, 2-41) | 5-1-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 75, 84, 87. |
| 53 | Mechanic School Rating (Manual 53, 5-40) | 9-15-40 | In stock at C. A. A. and on sale at G. P. O. | .05 | 75, 87. |
| | **AIR NAVIGATION** | | | | |
| 60 | Air Traffic Rules (Manual 60; Part 1, 12-1-40; Part 2, 8-1-40; Part 3, 12-1-40). | 10-4-40 | In stock at C. A. A. and on sale at G. P. O. | .10 | 80, 90, 93, 102, 104, 106, 108, 114, 119, 120, 121. |
| 61 | Scheduled Air Carrier Rules (Interstate) | 1-1-41 | In stock; at C. A. A. and on sale at G. P. O. | .05 | 91, 94, 97, 100, 102, 103, 115,[1] 120. |
| | **MISCELLANEOUS** | | | | |
| 98 | Definitions | 11-15-40 | In stock; order from C. A. A. only | | |
| 99 | Mode of Citation of Regulation | 11-15-40 | In stock; order from C. A. A. only | | |

[1] Effective Aug. 1, 1941.
[2] Revised Part, AIRCRAFT ENGINE AIRWORTHINESS, effective Aug. 1, 1941.
[3] Amendment as issued by C. & I. Div. Release No. 50, 6-3-41.
[4] Amendment 4-14-41 issued as C. & I. Div. Release No. 45.

U. S. GOVERNMENT PRINTING OFFICE: 1941